

ACCOUNTING FOR INFRASTRUCTURAL ASSETS: PERSPECTIVES FROM WITHIN NEW ZEALAND LOCAL GOVERNMENT

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Master of Commerce
in
Accountancy, Finance and Information Systems,
in the
University of Canterbury
by
JAMES LAWRENCE DOYLE

University of Canterbury
1996

*To my Mother and Father
— for always encouraging me to
do my best and teaching me the
principle of sowing and reaping.*

HJ
9779
N5
D754
1996

TABLE OF CONTENTS

ABSTRACT	vii
CHAPTER 1: INTRODUCTION AND BACKGROUND	1
1. Introduction	2
2. Background	2
3. Research Objective.....	8
4. Overview	9
CHAPTER 2: DEFINITION AND CLASSIFICATION	13
1. Introduction	14
2. Infrastructural Assets are Assets.....	14
3. Definition Necessary for Classification.....	16
4. Defining Infrastructural Assets	17
5. Classification of Infrastructural Assets Enables Renewal Accounting to be Applied	36
6. Chapter Summary	36
CHAPTER 3: INTERNATIONAL DEVELOPMENTS.....	37
1. Introduction	38
2. Canada	38
3. The United States.....	39
4. The United Kingdom	40
5. International Federation of Accountants.....	44
6. Australia	45
7. Chapter Summary	49
CHAPTER 4: ACCOUNTING IN NEW ZEALAND LOCAL GOVERNMENT	51
1. Introduction	52
2. Financial Management Reform in New Zealand Local Government	52
3. Valuation of Infrastructural Assets.....	54
4. Accounting for Infrastructural Assets.....	57
5. Asset Management Information Systems, Condition Monitoring and Asset Management Plans	68
6. Chapter Summary	74
CHAPTER 5: RENEWAL ACCOUNTING	77
1. Introduction	78
2. The Cash Accounting Approach	79
3. The Deferred Maintenance Approach.....	83
4. Chapter Summary	97
CHAPTER 6: RENEWAL ACCOUNTING AND TRADITIONAL DEPRECIATION.....	99
1. Introduction	100
2. Renewal Accounting Contrasted with Traditional Depreciation.....	100
3. Considerations Relevant to Using Renewal Accounting.....	101
4. Chapter Summary	111

CHAPTER 7: RESEARCH METHOD.....	115
1. Introduction	116
2. Choice and Description of the Research Method.....	116
3. Literature Review.....	117
4. Survey Method.....	118
5. Quality of the Research Method	128
6. Chapter Summary	132
CHAPTER 8: ACCOUNTING POLICIES OF SURVEYED LOCAL AUTHORITIES	135
1. Introduction	136
2. Accounting Policies of Surveyed Local Authorities.....	136
3. Surveyed Entities which have Adopted Renewal Accounting.....	140
4. Surveyed Entities which have Adopted Traditional Depreciation.....	143
5. Information Disclosed in the Financial Statements	144
6. Chapter Summary	149
CHAPTER 9: INTERVIEWEES' VIEWS.....	151
1. Introduction	152
2. Accounting for and Managing Infrastructural Assets.....	152
3. Requirements of Renewal Accounting	166
4. Considerations Relevant to Using Renewal Accounting.....	174
5. Chapter Summary	181
CHAPTER 10: DISCUSSION, LIMITATIONS, IMPLICATIONS AND CONCLUSION	185
1. Introduction	186
2. Discussion.....	186
3. Limitations.....	199
4. Implications for Practice and Further Research	200
5. Conclusion.....	203
ACKNOWLEDGMENTS	207
BIBLIOGRAPHY	209
APPENDICES	225

LIST OF EXHIBITS, FIGURES AND TABLES

Exhibits

Exhibit 2.1: Network vs Discrete and Finite vs Indefinite Lived Assets	31
Exhibit 8.1: Disclosure of Information on Infrastructural Assets by Entity using Renewal Accounting	145
Exhibit 8.2: Renewal Accounting Summary	146
Exhibit 8.3: Alternative Disclosure of Information on Infrastructural Assets	147
Exhibit 8.4: Disclosure of Information on Infrastructural Assets by Entity using Traditional Depreciation	148

Figures

Figure 2.1: Pipeline Economic Life	32
Figure 2.2: Pipeline Network Economic Life	32
Figure 2.3: Conceptual Distinction between Classes of Non-Current Assets	35
Figure 4.1: Asset Management Information Systems and Asset Management Plans	70
Figure 4.2: Asset Management Plans in the Context of Long Term Planning	73
Figure 9.1: Life Cycle and Maintenance/Deterioration Relationship for Roads	170

Tables

Table 4.1: Accounting Treatment of Infrastructural Assets by Local Authorities	58
Table 5.1: Adjustment of Asset Value for Changes in Service Potential	92
Table 6.1: Renewal Accounting vs Traditional Depreciation	100
Table 7.1: Interviews Conducted in Surveyed Local Authorities	123
Table 8.1: Valuation Methods Used by Surveyed Local Authorities	137
Table 8.2: Asset Management Information Systems Used for Pipelines	137
Table 8.3: Existence of Asset Management Plans in Surveyed Local Authorities	138
Table 8.4: Accounting Policies for Infrastructural Assets of Surveyed Local Authorities	139
Table 8.5: Basis for Calculation of Maintenance Requirements	142

ABSTRACT

There is no generally accepted accounting practice for infrastructural assets with respect to either their definition or how to account for them. Renewal accounting is an alternative to the generally accepted basis of accounting for fixed assets—traditional depreciation. It assumes that infrastructural networks have indefinite useful lives. Expenditure on maintenance is expensed and no depreciation is charged, provided the network's service potential is maintained.

This thesis examines recent developments in accounting for infrastructural assets in New Zealand local government. A survey, comprising 18 senior managers from within 12 local authorities, was undertaken with the aim of ascertaining accounting practices and gaining their views on key issues identified from the literature. The survey found that local government managers perceive asset management planning to be very important. Consequently, there is a concerted effort toward collecting information on infrastructural assets and developing asset management plans (AMPs). Developments in these areas will improve both the reliability of information for internal management purposes and for general purpose financial reporting, whether under renewal accounting or traditional depreciation.

It is concluded from the study that infrastructural assets should be defined as a conceptually distinct group which have the characteristics of networks with indefinite useful lives. The study also revealed that renewal accounting has widespread acceptance within New Zealand local government and is, arguably, the preferred alternative for infrastructural assets. This is because it contributes to better asset management; it makes maintenance and deferred maintenance on infrastructure transparent; and it supports the democratic process, where levels of service in AMPs are agreed in consultation with the public.

Following the direction suggested by the interviewees' views canvassed in this thesis, the next stage requires the development of a financial reporting standard which addresses renewal accounting and the circumstances under which it should be applied.

Chapter 1

INTRODUCTION AND BACKGROUND

1. INTRODUCTION	2
2. BACKGROUND.....	2
2.1 <i>Deterioration and Deferral of Maintenance on Infrastructural Assets</i>	3
2.2 <i>Accounting for Infrastructural Assets</i>	4
2.3 <i>Renewal Accounting vs Traditional Depreciation Accounting in New Zealand Local Government</i>	6
3. RESEARCH OBJECTIVE	8
4. OVERVIEW.....	9

1. Introduction

In recent years, mounting interest in accounting for infrastructural assets has been prompted by concern over the deterioration of infrastructure and a shift towards a greater use of accrual accounting in the public sector (Pallot, 1995). Accounting for governmental assets had predominantly been on a cash basis and did not require the recognition of assets in the balance sheet (Pallot, 1992a). However, with the adoption of accrual accounting, recognition and measurement of non-current assets is necessary (Peirson and Ramsay, 1994). Therefore, the issue of accounting for infrastructural assets for general purpose financial reporting arises. In particular, New Zealand local government entities have had to adopt accrual accounting and generally accepted accounting practice (GAAP)¹ through changes in the Local Government Amendment Act (No. 2) 1989.

This thesis examines recent developments in accounting for infrastructural assets in New Zealand local government.

The purpose of this chapter is to provide the background and rationale for the thesis. First, both the problem of the deterioration of, and the need for information concerning deferred maintenance on, infrastructural assets are discussed. Second, the background relating to accounting for infrastructural assets and the absence of a GAAP is outlined. Third, the debate with respect to renewal accounting as an alternative to traditional depreciation accounting for infrastructural assets in New Zealand local government is discussed. Fourth, the overall objective of the thesis and the rationale for why it focuses on accounting for infrastructural assets in New Zealand local government is presented. Finally, an overview of the entire thesis is provided.

2. Background

Infrastructural assets are the backbone of essential services, often taken for granted, such as roads, water supply, sewerage and drainage. Consequently, the importance of adequately managing these assets is of the utmost importance for the safety and well-being of the community (Audit Office, 1993a, p. 34).

¹ Note: While the term 'GAAP' may refer to "generally accepted accounting principles" elsewhere (e.g. in Australia, see Hoggett and Edwards, 1996, p. 12), in New Zealand it is frequently referred to as "generally accepted accounting practice" (e.g. see s3 Financial Reporting Act 1993). Therefore, the meaning of GAAP has been used interchangeably in this thesis.

2.1 Deterioration and Deferral of Maintenance on Infrastructural Assets

Interest in the subject of accounting for infrastructure assets has been prompted by concern over the deterioration of infrastructural assets (Pallot, 1995). Reports over the inadequacy, or deferral, of maintenance on infrastructure assets and their continuing deterioration and failure, have received much public attention, particularly in the United States.² Deferred maintenance has also been identified as a major problem or concern, particularly at the municipal level, in Canada (CICA, 1989), Australia (Burns, 1989, 1991; Flutter, 1991; Tonkin, 1991), and New Zealand (Pallot, 1994, 1995; Audit Office, 1993a, 1995; Chin, 1993).

Deferred maintenance can be described as:

The difference between the estimated outlays that would have been required to keep a capital asset in its normal operating condition and the amount of actual outlay (GASB, 1987a, p. 2).

Alternatively, it may be described as “the act of *not performing* (deferring) maintenance at the time it should have been, or was scheduled to be, performed” (GASB, 1987a, p. 33). In many cases, deferred maintenance has accelerated the impairment of assets and resulted in the need to replace those assets earlier than originally anticipated (GASB, 1987a). Long term deferral of maintenance increases costs (Pallot, 1994; CICA, 1989; GASB, 1987a) and results in intergenerational inequities (Pallot, 1994, 1995). Because infrastructural assets provide essential services, there are potentially serious consequences for communities if infrastructure is not maintained.³ Therefore, the public has an interest in how well infrastructure is being maintained (Taylor, 1995; Pallot, 1995; Hughs, 1994; Audit Office, 1994a). Indeed, a study by the United States GASB found that the information most required by users of governmental financial statements is the level of deferred maintenance (van Daniker and Kwaitkowski, 1986).

² See Grossman (1980); Choate and Walter (1981); Advisory Commission on Intergovernmental Relations (1984); Joint Economic Committee of Congress (1984); van Daniker and Kwaitkowski (1986); Governmental Accounting Standards Board (GASB) (1987a); and, more recently, Cities of Potholes and Playgrounds (1992); Zabush (1992); Propping up America (1994); and Hughs (1994).

³ The GASB (1987a, p. 33) states, “because the service capacity of capital assets generally deteriorates more rapidly if maintenance is postponed, the risk to public safety may increase, and the assets may become used up before the end of their expected service life. This may jeopardize the long-term financial condition, economic stability, and growth of a governmental entity or even pose a more immediate problem by creating a threat to public health and safety”.

Pallot (1994) argues that because of the widespread concern over deferred maintenance and its potential consequences, accounting for infrastructural assets needs to address the extent to which infrastructure is properly maintained and is able to continue providing essential services such as roading, water supply, sewerage and drainage in the future. An approach is needed which “best provides information on how well infrastructure is maintained and which encourages good management practices” (Pallot, 1994, p. 3).

2.2 Accounting for Infrastructural Assets

Financial reporting practices for infrastructural assets have been diverse in New Zealand (Pallot, 1995) and in other countries, including Australia (Micallef et al, 1994; Rowles, 1992; Sutcliffe et al, 1991), Canada (CICA, 1989), and the United States (GASB, 1987a).⁴ There has been considerable debate internationally about how best to account for infrastructural assets (Simpkins and Jensen, 1995a; Pallot, 1994; Micallef et al, 1994; Rowles, 1992).⁵ There are two reasons for this debate. There is no consensus on: (1) an appropriate definition, and (2) an accounting technique for infrastructure assets (Rowles, 1992; Sutcliffe et al, 1991). Sutcliffe et al (1991, pp. 63-64) state that the appropriate treatment of infrastructure assets is likely to be:

- (i) significant, because the creation or acquisition of “an infrastructure” usually involves a heavy commitment of resources; and
- (ii) contentious, because while some commentators are of the view that such assets are different from other physical assets, there appears to be no consensus on what makes them unique, what is the appropriate accounting technique to apply to them or how they should be defined. . . . In addition, valuation and depreciation of such assets can present significant practical problems.

Controversy over the definition of infrastructural assets centres around whether or not these assets form a conceptually distinct group of assets which require different accounting treatment to that of fixed assets in general (Pallot, 1995). Although there is no generally accepted definition of infrastructural assets (Pallot, 1994, 1995; Rowles, 1992; Sutcliffe et

⁴ Additionally, external financial reporting of infrastructure assets in the financial statements of governmental entities in the United States is optional (Hughs, 1994; Attmore, Miller, and Fountain, 1989; GASB, 1987a).

⁵ Debates over the capital accounting practices of local authorities have centred around the application of accrual accounting concepts to public sector entities and the notion of capital maintenance and depreciation of assets (see Taylor, 1989; Parkes, 1989; Jones, 1985). Furthermore, the use of depreciation accounting for fixed assets of governmental entities has been an ongoing controversy for years and is not only limited to infrastructure assets but extends to the fixed assets of governmental entities in general (see van Daniker and Kwaitkowski, 1986; Beacock, 1988; Dixon, 1988; Lapsley, 1980, 1986; Perrin, 1979, 1984; Drebin, 1979).

al, 1991), the term is usually thought to include roads, bridges, water and sewerage reticulation systems and flood control systems (Pallot, 1994).⁶

Two methods of accounting have been proposed to record the loss of service potential on infrastructural assets for general purpose financial reporting: (1) traditional depreciation accounting, and (2) renewal accounting. Traditional depreciation accounting for infrastructural assets is the normal practice of depreciation applied to fixed assets of commercial entities, which allocates the cost of an individual asset over its expected useful life, usually on a straight-line basis. Under traditional depreciation accounting, infrastructural assets are viewed as having finite useful lives. Conversely, renewal accounting assumes that infrastructural assets can have indefinite useful lives if they are properly maintained (Society of Local Government Managers (SOLGM), 1994a; Ministry of Commerce, 1994a; Pallot, 1994; Hay, 1994). Expenditures on the maintenance and renewal of assets are expensed instead of charging depreciation.

There are two main approaches to renewal accounting. One is essentially a cash accounting approach, where all expenditures on maintenance and replacement of assets are expensed as they occur (Pallot, 1994). The other is the deferred maintenance approach. This approach assumes that the infrastructural asset network is a single asset, which is maintained in perpetuity, and that the network as a whole has an indefinite useful life (SOLGM, 1994a; Ministry of Commerce, 1994a). The deferred maintenance approach attempts to recognise decreases in the condition of an infrastructural asset. As long as the infrastructure asset is renewed, the deferred maintenance reported is zero (Pallot, 1995; Audit Office, 1994a). Where maintenance is deferred, the cost foregone is deducted from the gross value of the asset in the balance sheet. An essential prerequisite for using the deferred maintenance approach to renewal accounting is operation of an asset management plan (Pallot, 1995; Audit Office, 1994a).

⁶ Note: the terms 'infrastructural' and 'infrastructure' are treated synonymously throughout this thesis to denote such assets.

2.3 Renewal Accounting vs Traditional Depreciation Accounting in New Zealand Local Government

Although there is support internationally for both recognising infrastructures as assets in the balance sheet and reporting a measure of the related loss of service potential in the income statement (Simpkins and Jensen, 1995a), New Zealand is one of the few countries to have addressed the issue at a practical level on a widespread basis (Pallot, 1995). Since the adoption of accrual accounting in the New Zealand public sector in 1989, entities have been grappling with the problem of how best to account for infrastructural assets in a manner which is relevant for both managers and elected representatives (Pallot, 1995; Simpkins and Jensen, 1995b).

Despite seven years of accrual accounting, the absence of a GAAP for infrastructural assets in New Zealand remains (Taylor, 1995; Ministry of Commerce, 1994b). While problems with initial recognition and valuation of infrastructural assets have mostly been resolved, acceptable approaches for accounting for changes in service potential are still being debated (Simpkins and Jensen, 1995b, p. 20). The debate currently revolves around the acceptability of renewal (or infrastructure) accounting as against the relevance of allocation-based depreciation (Simpkins and Jensen, 1995b, p. 20; Duncan, 1995). Simpkins and Jensen (1995b, p. 20) state, “to date, those in favour of renewal accounting have been more vocal, possibly because depreciation is so entrenched that supporters believe it needs no defence”.

Traditional depreciation accounting may not be the best means of measuring loss of service potential (Pallot, 1995; Currie, 1987), and may result in double counting of expenses (Duncan, 1995; Davin, 1993; Lewis, 1992). It may even take over the role of the allocation of public resources. However, this should be an issue for public debate (see Pallot, 1995, p. 17; Aiken, 1994, p. 34). Furthermore, it may not reflect users’ needs for information about deferred maintenance, show the real deterioration of infrastructural assets, nor encourage good management practices (Audit Office, 1994a; Brady, 1993).

Brady (1993, p. 4) asserts, “depreciation in the area of infrastructural assets is purely a guess and basically useless as a management tool”. He argues that, while depreciation is relevant for assets, such as plant, equipment and vehicles, infrastructural assets are different because “they are long lived and generally you don’t throw out your whole

roading system at once” (p. 5). What is critical is the difference in value from year to year and that the real question which must be asked is: “Is the infrastructural asset being maintained?” (p. 4). Furthermore, infrastructural assets are effectively maintained in perpetuity and:

A depreciation figure that is based on one or two percent of the value of the asset spread over 70-100 years is not much help. The real deterioration of the asset over the year is what is important (Brady, 1993, p. 5).

The relevance of traditional depreciation accounting and the need for information about the real deterioration of infrastructural assets is also advocated by the Audit Office (1993b, p.16):

Councils and their ratepayers are vitally interested in whether the work that is being done each year is sufficient to maintain the assets at a predetermined acceptable standard. Consequently, depreciation based on actual deterioration during the year is far more relevant than an estimated figure based on the projected life of the asset type.

Moreover, the Audit Office argues:

While the normal method of charging depreciation meets currently generally accepted accounting practice, the use of a maintenance plan approach is far more relevant in making councils aware of exactly what deterioration is expected each year. Then council can compare what should have been done to maintain the assets against what was done, and any deficiency or deferred maintenance can be dealt with (p. 16).

It also suggests that infrastructural assets are different from other fixed assets, to the extent that they have very long lives and in some instances are effectively maintained in perpetuity (Audit Office, 1993b). Furthermore, the common approach to accounting for infrastructural assets is to charge a fixed percentage of the value of each asset over its expected useful life as depreciation each year (straight-line depreciation, Audit Office, 1993b). While it may be argued that this approach may provide a reasonable accounting estimate for many assets, it is inadequate for management and accountability purposes with regard to infrastructural assets (Duncan, 1995; Audit Office, 1993b).

Renewal accounting, on the other hand, is being increasingly adopted by New Zealand local authorities (Pallot, 1995; Smith, 1995; Hay, 1994; Audit Office, 1994a). It is being proposed as an alternative method to traditional depreciation accounting for infrastructural assets of local authorities by the SOLGM (1994a), for electric power companies by the

Ministry of Commerce (1994a), and the method also has the support of the Audit Office.⁷ Furthermore, Duncan (1995, p. 15) states:

It is in the knowledge that renewal accounting is fully endorsed by Audit New Zealand and many other local authorities that North Shore City [Council] is now publicly exhorting the Society of Accountants to accept renewal accounting and incorporate the policy within a revised SSAP 28.

Moreover, he argues:

. . . the primary issue to be addressed in respect of infrastructural assets is the management of such assets, including the continual renewal of their service potential. I believe that this can best be achieved by the adoption of a renewal accounting regime . . . (p. 15).

3. Research Objective

The foregoing discussion has established that infrastructural assets pose significant accounting issues for local authorities, yet there is neither an agreed definition nor a GAAP for these assets. Consequently, the objective of this thesis is to:

Examine recent developments in accounting for infrastructural assets for general purpose financial reporting and internal management within New Zealand local government.

To address this objective, a survey of 12 New Zealand local authorities was undertaken to ascertain their accounting practices and to obtain the perspective of 18 local government managers on key issues concerning infrastructural assets.⁸

The importance of this topic for accounting for infrastructural assets in New Zealand local government is demonstrated by the following four points. First, the majority of infrastructural assets in New Zealand are controlled by local authorities, making up approximately seventy percent of local government fixed assets (Pallot, 1995).⁹

⁷ The Audit Office (1994a) has indicated its acceptance of either method of accounting (depreciation or renewal accounting), provided that councils report any reduction in service potential, whether as depreciation or as deferred maintenance.

⁸ Eighteen senior local government managers (13 accountants and five engineers), were surveyed for their views concerning nine issues identified from the literature (see Chapter 7, p. 117).

⁹ Note: state highways are the only significant infrastructural asset held by central government, which comprise approximately 11 percent of Crown assets (Pallot, 1995). Central government has adopted straight-line depreciation for state highways which have been valued at depreciated replacement cost (Pallot, 1995), at around \$10 billion (Kearney and Davin, 1994). This thesis will not address central government infrastructural assets specifically, although by examining the principles of accounting for infrastructural assets, it will apply similarly to such assets in other sectors.

Second, the most pressing problems are with the utilities of local authorities (Smith, 1995). Given the recency of the requirements to report on infrastructural assets, reporting and data collection techniques are relatively undeveloped (Smith, 1995). In other sectors, such as telecommunications and energy distribution, there is a much longer track record in contrast to accounting for these assets in local government (Smith, 1995).

Third, developments in reporting of infrastructural assets in the commercial sector in New Zealand have been driven largely by the monitoring of performance and pricing practices (Pallot, 1995), as seen in the Ministry of Commerce's (1994a) renewal accounting guidelines for electric power companies. In contrast, the accounting problems of local authority infrastructural assets arose from the 1989 local government reforms and there is considerable diversity in practice in accounting for these assets amongst local government bodies (Pallot, 1995; Taylor, 1995; Hay, 1994). This diversity in practice and lack of GAAP suggest the need for a financial reporting standard in this area (Pallot, 1995), providing a further relevant purpose for this study.

Fourth, GAAP continues to be developed in this area and renewal accounting is becoming more widely adopted among local authorities and other entities (Hay, 1994).¹⁰ Questions as to the applicability of renewal accounting for infrastructural assets will need to be examined within the current revision and amalgamation of SSAP 28 (New Zealand Society of Accountants (NZSA), 1991) and SSAP 3 (NZSA, 1984) by the NZSA (van Zijl, 1994a).¹¹ Any accounting standards promulgated in this area will apply to both public and private sector entities since the NZSA's (1993) Statement of Concepts and financial reporting standards apply to both types of entities (Simpkins and Jensen, 1995a).

4. Overview

Chapter 2 examines the main characteristics and arguments concerning the characteristics of infrastructural assets presented in the literature. It is argued in this chapter that infrastructural assets can be distinguished as a separately distinct group of assets. They

¹⁰ In the electricity sector, Wairarapa Electricity Limited is using renewal accounting for financial reporting purposes (Hay, 1994; Ministry of Commerce, 1994b), and Trans Power New Zealand Ltd is using an approach similar to renewal accounting (Ministry of Commerce, 1994b).

¹¹ An exposure draft of the revised financial reporting standard is expected to be available in late 1996 (Baskerville, 1996).

may be defined as networks or systems of assets which, as a whole, have indefinite useful lives even though individual components will need to be replaced. Furthermore, there is a case for recognising public sector infrastructural assets as community assets.

Chapter 3 outlines international developments in accounting for infrastructural assets and concludes that there is no GAAP, though there is general agreement that infrastructural assets should be recognised, and some measure of the loss of service potential on these assets be reported in the financial statements. Furthermore, there is considerable support for developing and using a renewal accounting approach for infrastructural assets.

Chapter 4 provides the background to recent developments in accounting for infrastructural assets in New Zealand local government. The local government financial management reforms, valuation methods for infrastructural assets, and relevant accounting concepts and New Zealand accounting standards are examined. This is followed by an outline of accounting guidelines promoted in New Zealand for infrastructural assets. Next, the inadequacy of information and lack of formal asset management information systems for infrastructural assets of local authorities are discussed. Finally, the importance of asset management plans and the progress which local government entities are making towards improved management of infrastructural assets are set out.

Chapter 5 examines the two forms of renewal accounting found in the literature; the cash accounting approach and the deferred maintenance approach. The cash accounting approach to renewal accounting is rejected in favour of the (more recent) deferred maintenance approach. The main requirements and assumptions of the deferred maintenance approach are then examined.

Chapter 6 compares and contrasts renewal accounting with traditional depreciation accounting and identifies a number of considerations raised in the literature which are relevant to using renewal accounting.

Chapter 7 outlines the research method used and describes the survey of local authorities. Nine issues related to accounting for, and managing, infrastructural assets are identified from the literature review for further examination. These nine issues were used to develop questions for the interviews of 18 local government managers from within 12 New

Zealand local authorities (including the nine largest city councils). The survey also sought to determine how local authorities account for their infrastructural assets in practice.

Chapters 8 and 9 present the results of the survey. Chapter 8 discusses the accounting policies of the surveyed local authorities and illustrates how they disclose information on infrastructural assets in their financial statements. Chapter 9 presents the interviewees' views about the nine issues identified in Chapter 7, which are related to accounting for, and managing, infrastructural assets.

Chapter 10 discusses the results of the study, outlines the limitations of the research method, suggests several implications for practice and further research, and presents the main conclusions reached in the thesis.

Chapter 2

DEFINITION AND CLASSIFICATION

1. INTRODUCTION	14
2. INFRASTRUCTURAL ASSETS ARE ASSETS.....	14
3. DEFINITION NECESSARY FOR CLASSIFICATION.....	16
4. DEFINING INFRASTRUCTURAL ASSETS.....	17
4.1 <i>General Characteristics of Infrastructural Assets</i>	17
4.1.1 General Fundamentals.....	18
4.1.2 Infrastructural Assets: Public Facilities.....	18
4.1.3 Definition by List Unsatisfactory	20
4.1.4 Summary.....	20
4.2 <i>Infrastructure Assets Not Conceptually Distinct</i>	20
4.3 <i>Community Assets</i>	22
4.3.1 Definition of Community Assets.....	23
4.3.2 Community Assets Concept Withdrawn.....	24
4.3.3 Separate Classification of Community Assets	25
4.4 <i>Infrastructural Networks/Systems with Indefinite Lives</i>	26
4.4.1 Infrastructural Assets are Networks	27
4.4.2 SOLGM Definitions of Infrastructural Assets	28
4.4.3 Indefinite Useful Life.....	30
4.4.4 Conclusion.....	34
5. CLASSIFICATION OF INFRASTRUCTURAL ASSETS ENABLES RENEWAL ACCOUNTING TO BE APPLIED	36
6. CHAPTER SUMMARY	36

1. Introduction

There is no generally accepted definition of infrastructural assets (Pallot, 1994, 1995; Rowles, 1992; Sutcliffe, et al, 1991). The debate over the definition and accounting treatment of infrastructure assets centres around whether they form a conceptually distinct group of physical assets (Pallot, 1994). Mitchell (1993) states that the vexed questions relating to infrastructural assets are numerous, and range from suggestions that they are no different from any other fixed assets to views that they may not be assets at all.

This chapter reviews the literature pertaining to the characteristics of infrastructural assets and attempts to provide a definition of these assets which is operationally useful for classification purposes in financial reports. The chapter begins by establishing that infrastructural assets are in fact assets for financial reporting purposes, based upon the definition and recognition criteria of assets in the Statement of Concepts (NZSA, 1993). The remainder of the chapter examines various arguments about the defining characteristics of infrastructural assets. It is concluded that such assets are a distinct group having the characteristics of being networks with indefinite useful lives. Furthermore, by creating a separate classification of fixed assets, named infrastructural assets, this enables different accounting principles and methods to be applied, most notably renewal accounting.

2. Infrastructural Assets are Assets

Mautz (1981) argued for the recognition of public sector assets, including infrastructural assets, as liabilities. Public sector assets, such as monuments, city parks, and universities, often do not produce positive cashflows, rather they use resources for their continual maintenance. Therefore, Mautz argued that there may be a case for recognising them not as assets but as liabilities, since “a negative cashflow to the owning government is assured if the government meets its implied commitment to keep these facilities operational and open to the public” (Mautz, 1981, p. 54). Mautz (1988, p. 125) later modified his argument to viewing such assets as commitments, not liabilities, and adopted the term “facilities”, which are “properties essential to the purposes of a not-for-profit organization that are acquired to facilitate the transfer of resources outward.” Mautz included the following items on his list: monuments, many public buildings, national and state parks,

highways, public schools, tax supported universities and colleges, local police and fire stations, and jails and prisons.

Pallot (1990b) refutes Mautz's argument on the grounds that he only examined the nature of public sector assets on one aspect of the definition of an asset. Pallot notes that the term 'asset' carries connotations that are broader than just the direction of cash flow and that we are clearly better off with the assets than without them. The characteristics of assets include that of service potential (or a probable future economic benefit), the existence of control of the asset by an entity and the asset arising as a result of a past transaction (Pallot, 1990b). Rowles (1991) also argues that Mautz's view is not supported when tested against the definition of a liability. The existence of a present obligation is an essential characteristic of a liability and expectations of expenditures of maintenance in the future do not constitute a present obligation.

For general purpose financial reporting, an asset will be recognised in the financial statements if it meets the definition and recognition criteria for assets. In New Zealand, the Statement of Concept's (NZSA, 1993) definition of an asset (consistent with many other standard setting authorities' definitions), is as follows:

Assets are service potential or future economic benefits controlled by the entity as a result of past transactions or other past events (para 7.7).

Assets have three essential characteristics: (1) there must be service potential or future economic benefits, (2) the entity must have control over the service potential or future economic benefits to the extent that the entity is able to enjoy the benefits, and deny or regulate access of others to the benefits, and (3) the transaction or event which gives rise to the entity's control over the service potential or future economic benefits must have occurred (NZSA, 1993, para 7.8). Recognition of assets in the statement of financial position occurs only when it is probable that the service potential or future economic benefits embodied in the asset will eventuate, and the asset possesses a cost or value that can be measured with reliability (NZSA, 1993, para 7.9).

The International Federation of Accountants (1994) has concluded that infrastructure assets meet the definition and recognition criteria of assets for financial reporting purposes (Pallot, 1994, 1995). Likewise, others have also come to the same conclusion (see

Rowles, 1992; Sutcliffe et al, 1991; CICA, 1989). For example, paraphrasing Sutcliffe et al (1991, pp. 64-65), infrastructural assets:

- (i) do assist the entity in achieving its objectives, whether those objectives be to provide a rail or road service, and therefore represent service potential;
- (ii) are controlled, that is, they will be used to achieve the objectives of the entity and their deployment will be a function of the entity's decision making, and
- (iii) are controlled as a result of a past transaction or other past event.

Therefore, whether or not infrastructural assets are assets and should be recognised in the financial statements appears no longer to be an issue.

3. Definition Necessary for Classification

No generally accepted definition of 'infrastructure' (or 'infrastructural') assets exists in the accounting literature (Pallot, 1994, 1995; Rowles, 1992; Sutcliffe et al, 1991; GASB, 1987a). Substantial debate surrounds whether infrastructural assets are a conceptually distinct group of physical assets requiring separate classification and different accounting treatment (Pallot, 1995). Rowles (1991) states that there appears to be no consensus on what makes infrastructure assets unique, how they might be defined, or on the accounting treatment appropriate for such assets. Furthermore, he contends:

If infrastructure . . . assets are a distinctive sub-group to which distinctive accounting principles are to be applied, a definition is required which will permit an operationally useful distinction to be made between physical assets generally and infrastructure . . . assets specifically (Rowles, 1991, p. 49).

Rowles (1992) also asserts that if infrastructure assets are different, inappropriate accounting would result if assets correctly regarded as infrastructure were classified and accounted for as "ordinary" physical assets. If this were to occur, the characteristic of the resulting financial information would be adversely affected.

Smithies (1993) argues that definitions proposed for infrastructure assets are attempts to focus on the common attributes of those assets and classify them so that an end purpose can be achieved. He states, "the end purpose of attempting to classify assets at all is in order to prepare meaningful financial reports which facilitate effective decision making" (p. 20). Classification by definition helps to form functional categories which can be used to determine how a particular asset is to be treated in the financial reports (Smithies, 1993). Furthermore, Pallot (1990a, p. 83) states, "clear definition (i.e. identification of the

common features) enables concepts to be communicated to others and ensures we are communicating about the same objects” and, “. . . allows consistent classification”.

The growing acceptance of renewal accounting, and the difficulties encountered in valuing and applying traditional depreciation to infrastructural assets, suggest that these assets are different from other fixed assets. Therefore, their essential characteristics need to be identified and clearly defined.

4. Defining Infrastructural Assets

The major characteristics or arguments concerning the characteristics of infrastructural assets presented in the academic and professional accounting literature seem to be:

- General characteristics of infrastructural assets;
- Infrastructure assets are not conceptually distinct;
- Community assets; and
- Network/systems of assets with indefinite useful lives.

These are examined in turn below.

4.1 *General Characteristics of Infrastructural Assets*

In general, infrastructure assets refer to a diverse range of assets held by both public and private sector entities, though they are predominantly controlled by governments (Rowles, 1992; CICA, 1989). They represent a significant proportion of total government assets, a large investment of community resources, and are usually identified as assets which are anticipated to have very long lives (Rowles, 1991).

The term ‘infrastructure’ itself refers to a very broad range of assets. The Concise Oxford Dictionary (1990) defines ‘infrastructure’ as:

- the basic structural foundations of a society or enterprise; a substructure or foundation
- roads, bridges, sewers, etc., regarded as a country’s economic foundation.¹

The above definition implies that infrastructural assets are the economic foundation, or basic structural foundation of a society. Such assets can be regarded as those which

¹ *The Concise Oxford Dictionary of Current English*, (1990) 8th ed., edited by R.E. Allen, Oxford University Press Inc., New York.

provide essential services, for example, clean water, sanitation, transport, energy provision. Pallot (1990a) notes that the term ‘infrastructure’ seems to refer to assets of a civil engineering nature.² However, these broad characteristics are unhelpful in defining a conceptually distinct group of assets.

4.1.1 General Fundamentals

Taylor (1995, p. 2) notes that there is reasonable common agreement on the following fundamentals:

- There is a huge collective investment in infrastructure in developed countries at least.
- Well maintained infrastructure is critical to a country’s economic and social well being.
- Prolonged deferral of maintenance can have serious consequences for a community and not always for the same generation who avoided paying for the maintenance.
- The public has a genuine interest in and the right to know how well the infrastructure is being maintained.

For both definition and accounting purposes, however, these are also unhelpful in identifying and classifying and defining infrastructural assets. References to the general functions and fundamentals of such assets merely describe them in very broad terms and do not enable clear identification of characteristics which illustrate their differences from ordinary fixed assets.

4.1.2 Infrastructural Assets: Public Facilities

Infrastructure assets are often defined in terms of being public facilities of some sort, often held by governmental or public sector entities. A very broad definition of infrastructure is used by the Associated General Contractors of America, as follows:

The nation’s infrastructure is its system of public facilities, both publicly and privately funded, which provide for the delivery of essential services and a sustained standard of living. This interdependent, yet self-contained, set of structures provides for mobility, shelter, services and utilities. It is the nation’s highways, bridges, railroads and mass transit systems. It is our sewers, sewerage treatment plants, water supply systems and reservoirs. It is our dams, locks, waterways and ports. It is our electric, gas and power producing plants. It is our court houses, jails, fire houses, police stations, schools, post offices and government buildings.

America’s infrastructure is the base upon which society rests. Its condition affects our life styles and security and each is threatened by its unanswered decay (1982, p. 1).³

² Furthermore, adoption of the term, in part, seems to stem from its use in the political arena following media attention over the deterioration and collapse of bridges, roads, and railways in America in the early 1980s (Pallot, 1990a).

³ Associated General Contractors of America, (1982) *Our Fractured Framework: Why America Must Rebuild*, Associated General Contractors of America, Washington, D.C., cited in van Daniker and Kwaitkowski (1986, p. 9).

The above definition describes infrastructure in terms of systems of public facilities which provide essential services and are necessary for a sustained standard of living. However, van Daniker and Kwaitkowski (1986) argue that such a definition is too broad since it would encompass practically all long-lived assets owned by governments and many assets that are not owned or operated by governments. They argue that a more useful definition, which is more limited and appears to have general acceptance, is found in National Council on Governmental Accounting (NCGA) Statement 1, *Governmental Accounting and Financial Reporting Principles* (1979), wherein, infrastructure assets are defined as “roads, bridges, curbs and gutters, streets and sidewalks, drainage systems, lighting systems, and similar assets that are immovable and of value only to the governmental unit” (pp. 9-10).

This definition is limited to public sector infrastructural assets only, yet, as noted above, infrastructural assets can be owned by private sector entities. Furthermore, the terms “immovable” and “of value only to the governmental unit” are not defined, and seem unsatisfactory as criteria for defining infrastructure assets (Pallot, 1988, 1990b). Pallot (1990a) argues that immovability is an interesting characteristic not so much in itself, but because of other characteristics with which it is highly correlated, namely, permanence/long life and non-substitutability rather than exchange value. She also notes that the criterion of assets as being of value only to the governmental entity seems hard to understand since the assets are unquestionably of value to the community at large. Furthermore, governmental units do not generally have full control over their assets. There may be difficulty in selling public assets because of legal restrictions, or because their sale would be politically unacceptable (Pallot, 1990a). Pallot (1990a) suggests that:

If anything is to be salvaged from the GASB’s ‘value’ criterion [value only to the governmental entity], it would be that the asset is not readily exchangeable for one or both of the following reasons:

1. There is no ready market (manifest in no readily determinable market).
2. The government unit does not have the authority to sell or exchange the asset (a higher authority – the community at large – deems that the asset has greater value in use than in exchange) (p. 93).

These characteristics will be discussed later in this chapter within the discussion on community assets.

4.1.3 Definition by List Unsatisfactory

The GASB (1987a, p. 2) defines infrastructural assets by listing typical examples:

Infrastructure: is a term used to identify community or public domain capital assets. Infrastructure includes roads, bridges, curbs and gutters, streets and sidewalks, drainage systems, and transit railbeds, water and sewerage systems, and monuments.

Definitions by lists, however, are unsatisfactory because they are not exhaustive and do not illustrate the essential characteristics so that assets may be consistently identified, and, are therefore of limited value (Rowles, 1992).

4.1.4 Summary

Defining infrastructure assets by referring only to their general characteristics and general functions, limiting them only to public sector ownership, or defining them by list, does not enable a distinct group of assets to be separately identified and clearly distinguished from ordinary fixed assets in general.

4.2 Infrastructure Assets Not Conceptually Distinct

Rowles (1991, 1992) indicates that, when controlled by business entities in either the private or public sectors, infrastructure assets appear to be accounted for consistently with principles applicable to all other types of assets. Moreover, little, if anything, seems to distinguish assets of private sector entities from similar assets controlled by public sector entities, except that when controlled by not-for-profit entities in the public sector, costs are born by the community at large rather than by users (Rowles, 1992).

Rowles (1991, 1992) discusses the following characteristics of infrastructural assets which have been purported in the literature to distinguish them from other fixed assets:

- The costs of acquiring them are sunk (i.e. unalterable), and therefore irrelevant to future decisions;
- They serve social, or community, rather than commercial purposes;
- They are indivisible;
- They lack both a market and determinable economic life; and
- They have an infinite physical life (Rowles, 1991).

Rowles (1991, p. 49) contends that, on closer inspection, the above features are unhelpful for identifying the unique features of infrastructural assets since “most of them are characteristic of other types of assets, both in the public and private sectors, and the

remainder do not stand up to rigorous examination". For example, he argues that expenditures on many different types of long-term assets could be viewed as sunk costs since there is often no use for plant and equipment outside the specific purpose for which it was created, and hence no market value for such assets. However, he also notes that the costs incurred in acquiring such assets would normally be expected to be recovered through the use of these assets in the business of the entity, and entered into cost calculations. Furthermore, he asserts that most definitions of assets do not make a distinction between commercial or social purposes, but instead focus on the concept of economic benefit or service potential contributed by an asset to the entity, as the defining characteristic. Moreover, assets often cannot be divided into smaller parts and, furthermore, the valuation and estimation of physical and economic life are always problems confronting accountants and engineers. Finally, only land in most circumstances could be viewed as having an infinite life. Rowles (1992, pp. 39-40), concludes:

Evaluation of characteristics often held to distinguish infrastructure . . . assets from other physical assets indicates that they are qualities possessed by most physical assets. Indeed, they are characteristics of many assets recognised in the financial statements of profit-seeking entities. Therefore, the features noted do not provide a basis for distinguishing infrastructure . . . assets, unambiguously, from other physical assets.

Rowles (1992) also examined a range of different definitions of infrastructural assets found in the accounting literature.⁴ Many of them refer to features which are held to distinguish public sector infrastructure assets from other physical assets. They can be summarised in the following way and suggest that infrastructure assets are:

- public facilities;
- concerned with essential services;
- "immovable"; and
- necessary to sustain living standards (Rowles, 1992, p. 40).

However, Rowles (1992) argues that, whilst such qualities do seem to be features of infrastructure type assets of public sector entities, they do not appear to be uniquely confined to such assets. For example, the private sector also provides facilities that are available to the public and not all publicly owned facilities would be regarded as infrastructure. What might be a publicly provided infrastructure facility in one jurisdiction may be privately provided in another. Not all "essential" or "critical" services are publicly provided, and many physical assets are also "immovable". Furthermore, it can be argued that all physical assets are concerned with living standards. Therefore, Rowles (1992)

⁴ These definitions are reproduced in Appendix 1.

concludes that such attributes are unhelpful in distinguishing infrastructure as an identifiable subset of physical assets.

It is clear that Rowles (1991, 1992) sees no conceptual difference in the nature of infrastructure assets from other physical assets in general. Pallot (1995) notes, however, that while Rowles concentrates on the technical dimension of infrastructure, and fails to find any fundamental distinction, there is a fundamental difference between assets which are of the nature of common property and assets which are the “private” property of governmental units. There is a case for recognising the common property nature of infrastructural assets controlled by public sector entities, which may be described as “community assets”.

4.3 *Community Assets*

Community assets were included in the *Statement of Public Sector Accounting Concepts* (SPSAC, NZSA, 1987). SPSAC defined community assets as “infrastructural assets which have no determinable useful life and provide a social service rather than a commercial service” (NZSA, 1987, para 4.15).⁵ They were described as, “frequently large, not capable of subdivision for ready disposal, usually have no readily determinable market value and there may be constraints on the capacity of the reporting entity to dispose of such assets” (para 4.15). The term ‘community assets’ embodied assets of an infrastructural and a heritage nature.⁶ Nevertheless, as mentioned above by Rowles (1991), many of these characteristics seem unhelpful in distinguishing between infrastructural and other assets.

⁵ SPSAC proposed reporting community assets in non-financial terms in a Statement of Resources. Where feasible, some estimate of the value to the community was to be shown. Community assets were not to be depreciated as the wearing out of such assets could usually be made good by maintenance. Instead, the cost of use was to be reflected in expenditures on maintenance. Hence, advocating a form of renewal accounting for community assets.

⁶ Note: Infrastructural assets have often been discussed together with heritage assets in the context of public sector assets in general, particularly within the concept of community assets (see Rowles (1991, 1992); Pallot (1987, 1989, 1990a); and Mautz (1981, 1988). Heritage assets can be defined as “physical assets that a community intends preserving because of cultural, historic or environmental associations” (Rowles, 1992, p. 34), or, alternatively as “those assets a community intends preserving because of cultural, historic or environmental associations” (Taylor, 1995, p. 6). Such assets are considered worthy of preservation by the community and include assets such as art, museums, library collections, monuments, parks and buildings (Rowles, 1992). They are often publicly owned but are also controlled by not-for-profit private sector entities (Rowles, 1992). However, while public sector infrastructural assets have similar characteristics to heritage assets (such as long physical lives and restrictions on their use and disposal), it is the concern of this thesis to examine only issues relating to infrastructure assets as distinct from heritage, as well as other assets. Furthermore, it would be unwise to draw too strong a comparison without a detailed analysis of the issues relating to accounting for heritage assets. Such assets are quite different in their nature, purpose and scale (Taylor, 1995).

4.3.1 Definition of Community Assets

The NZSA's definition of community assets has been refined by Pallot (Pallot, 1989, 1990c). Pallot (1987, 1989, 1990a) concludes that the main criteria for distinguishing community assets from other assets are:

- the purpose for which the asset is used; and
- the saleability of the asset.

Her definition of community assets was included in the NZSA's (1990) Technical Guidance Bulletin (TGB-4) on *Defining and Reporting Community Assets* as follows:

Community assets are fixed assets of an infrastructural, environmental or cultural nature, held by a public sector entity and having the following characteristics:

- (i) They are used directly by the community at large
and
- (ii) They are non-substitutable and/or non-saleable (para 2.1).

An asset is considered non-substitutable if it is regarded as unique. For example, national parks, and historic buildings, which have intrinsic value rather than exchange value (NZSA, 1990). An asset can be considered non-saleable because there is no ready market for the asset and/or the reporting entity is prevented, in the public interest, from selling the asset (there may be legal restrictions on their sale or it may be politically unacceptable, see Pallot, 1990a; NZSA, 1990). Furthermore, whether an asset has the above characteristics will depend upon policy and community attitudes (Pallot, 1995; NZSA, 1990). A change in policy may result in a change in the classification of an asset (NZSA, 1990).

The concept of community assets has also been recognised in Australia. In a report by the Comptroller-General, Accounting Policy Statement, Number 4: *Recording and Reporting of Non-Current Physical Assets* (Victoria, Department of Management and Budget, 1989), community assets are distinguished from operating assets and are defined as:

... an asset or group of assets which are held in trust by the State for present and future generations of Victorians and are not available for disposal. The value to the community of a community asset is greater than its opportunities cost in an alternate commercial use. Such assets meet a community service obligation rather than providing a commercial service and display one or more of the following characteristics:

- the cost of the asset is not readily recoverable from revenue other than grants;
- it has no readily determinable physical life but generally will have a long physical life; and
- is large and not capable of subdivision for disposal.

Community assets fall into three major groups:

- Infrastructure assets - eg: roads, bridges, schools, hospitals, lighting systems;
- Heritage assets - eg: Parliament House, the Museum building; and

- Recreational assets - eg: Parks and gardens, recreational facilities (Victoria, Department of Management and Budget, 1989, p. 22).

The report states that the distinction between an operating asset and a community asset will often be a matter of judgement and depend on its end use and the value to the community. The notion of the “value to the community” is to be interpreted in the light of contemporary community attitudes, having regard to the following factors when evaluating community assets (p. 25):

- (a) Present use of the asset;
- (b) Likelihood of disposal of the asset being acceptable to the community;
- (c) Extent and force of representations from community groups and members of the public as to potential or planned alternative uses for the asset;
- (d) Existing Government policy with respect to the use of the asset; and
- (e) Importance of the asset in the social as opposed to the economic development of current and future generations of Victorians.

The report notes that the classification of an asset as a community or operating asset may move between categories over time due to demographic and other social or economic changes and contemporary community expectations. Additionally, community attitudes may change in the long run.

Whether or not an asset is a community asset or not will therefore depend upon policy and community attitudes at the time of financial reporting, having regard to the above factors. For example, if the governmental entity chose to exclude people from the use of the asset, it would cease to be a community asset (Pallot, 1995).

4.3.2 Community Assets Concept Withdrawn

The concept of community assets proposed in SPSAC (NZSA, 1987) has been withdrawn by the NZSA in New Zealand. In a press announcement (NZSA, 1992a), the NZSA’s Accounting Research and Standards Board (ARSB) stated that SPSAC and associated public sector guidelines were at variance with the generally accepted accounting practice (GAAP) that was developing in the public sector in New Zealand.⁷ Furthermore, “references to Community Assets and to Commercial and Service Oriented Entities are obsolete and these concepts are no longer used in the public sector in New Zealand”

⁷ The announcement was referring to the NZSA’s *Proposed Framework for Financial Reporting in New Zealand* (issued by the Accounting Research and Standards Board, Wellington, 1992b), which contained exposure drafts of the Statement of Concepts (NZSA, 1993) and accounting standards which have become applicable to both public and private sector entities.

(NZSA, 1992a, p. 68). SPSAC and other public sector accounting statements were subsequently withdrawn.

4.3.3 Separate Classification of Community Assets

Despite the withdrawal of SPSAC, the concept of community assets is, arguably, still relevant to public sector entities with infrastructural assets. Such assets might still be treated as a conceptually distinct group (Pallot, 1995). As Pallot (1994, p. 5) suggests:

There is an issue of whether infrastructure assets . . . under some circumstances form part of a group of assets which we might refer to as “community assets” because of the community involvement in decision making and the duties that the governmental unit has to the community with respect to these assets.

Pallot (1992a) points out that, despite an apparent diversity in the literature of the definitions of assets, there are two recurring themes: assets are economic resources, and there are property rights and obligations (aspects of ownership and control) attached to them. She argues that the concept of common property (the right not to be excluded from something) can be applied alongside the notion of assets based on private property to some assets held by public sector entities (Pallot, 1992a). Whereas management has a right to *exclude* the general public from the use of ordinary fixed assets, in the case of a community asset there is a *duty* to make the asset available and accessible to the public (Pallot, 1990a). Furthermore, the notion of common property could be recognised within the concept of community assets. This notion is considered more useful in handling issues such as intergenerational equity and democratic control over the use of society’s wealth than the traditional concept of assets based solely on private property (Pallot, 1990a). Moreover:

The concept of community assets is an attempt to give greater visibility to the idea of shared interests in a society in preference to pretending that only individual private interests exists. In developing the concept, assets were seen as having a social (i.e. property) dimension in addition to a purely technical (i.e. resource) dimension. The adoption of the term ‘community assets’ rather than terms such as ‘infrastructure assets’ is an attempt to reinforce the social view and redress the imbalance between it and the technical view (Pallot, 1990a, pp. 204-205).

Therefore, community assets have both a technical and a social dimension. Pallot (1995) suggests that, with respect to governmental assets, the social dimension of such assets requires the consideration of the rights of the public at large to both use the assets directly and to participate in significant decisions, such as those relating to their replacement or sale.

Separately classifying community assets may have implications for their accounting treatment (Pallot, 1994). Pallot (1995, pp. 5-6) points out, for example, that in the case of a road, it does not mean that it has to be given identical accounting treatment in all circumstances and that “a public road is different from a private road or one operated primarily for commercial gain”. Furthermore:

That a physically identical asset could be a community asset in some circumstances and an ordinary fixed asset in others is similar to the situation we have already in accounting where an item could be a current asset in some circumstances and a fixed asset in others (Pallot, 1994, p. 6).

In an earlier work, Pallot (1990a) argues that focusing on the economic and technical view of accounting would tend to result in arguments in favour of depreciation. However, if the social dimensions of accounting policy are examined, the desirability of depreciation of public sector assets becomes much more questionable (Pallot, 1990a).

One way in which the nature of community assets might be acknowledged is through the use of separate financial statements (Pallot, 1995). The Federal Accounting Standards Advisory Board in the United States proposes two statements: a statement of the entity's own operating assets and liabilities, and a stewardship statement, which would include heritage assets and the like (Pallot, 1995).

4.4 Infrastructural Networks/Systems with Indefinite Lives

Most of the literature reviewed thus far has tended to ignore one of the fundamental physical characteristics of infrastructural assets. That is, infrastructural assets are frequently described, or referred to, as systems or networks of assets with indefinite useful lives.⁸

Infrastructural assets can be distinguished from ordinary fixed assets on technical grounds alone in that they have the characteristic of being a system or network of assets with an indefinite useful life (Pallot, 1995). For instance, Pallot (1994, p. 4) indicates:

⁸ For instance, see: Pallot (1995, 1994); Taylor (1995); SOLGM (1994a); Seed and Horsley (1994); Kearney and Davin (1994); Davin (1993); and Price Waterhouse (1989).

There appears to be widespread recognition that infrastructure assets can be distinguished from ordinary fixed assets on technical grounds in that they form a network and, while individual parts wear out, the system as a whole can have an indefinite life.

Moreover, she notes that this has been acknowledged in the commercial sector as well as in local government.

Seed and Horsley (1994, p. 2) also define infrastructural assets as networks with indefinite lives:

In general, infrastructural networks are an asset system which has an indefinite service life even though the individual components have finite physical lives.

They note that this definition implies that valuers need to consider infrastructural assets at two levels: the system and the individual parts which go to make up the whole. Furthermore, parts of the system will be renovated, refurbished or replaced as they age. Therefore, the potential life of the system can be thought of as being indefinite.

Where infrastructural assets are defined as networks, public or private sector ownership becomes unimportant as a defining characteristic.⁹ Furthermore, Pallot (1995) suggests that, rather than differences between the public and private sectors, the physical nature of networks determine the need for differing accounting methods for infrastructural assets.

Infrastructural networks come in a number of forms. For example, roading, railways, electricity line businesses, power station networks, gas distribution lines, telecommunications and sewerage systems all have characteristics of networks (Seed and Horsley, 1994).

4.4.1 Infrastructural Assets are Networks

In the Price Waterhouse (1989) report, infrastructure assets are described in terms of underground networks which “are made up of systems, each of which is effectively a single asset which is required to be maintained in perpetuity” (para 2.5, p. 4). The report gives a description of what assets are considered to be infrastructure, in terms of the water and sewerage systems of UK water authorities as follows:

⁹ The view that public sector ownership is one of the key characteristics of infrastructural assets has been largely superseded (Deloitte Touche Tohmatsu, 1995a; Kearney and Davin, 1994).

Infrastructure assets are the underground systems of mains and sewers, the impounding and pumped raw water storage reservoirs, dams and sea outfalls (para. 2.8, p. 5).

The guidelines state that the approach to viewing infrastructure assets as networks of systems, rather than individual assets, is appropriate because:

- the individual components of the systems are of no separate economic use. They provide economic benefits only when combined into a coherent system;
- mains, sewers and other infrastructure assets are operated, maintained and managed as networks of systems, not as individual assets; and
- the lives of individual assets are not predictable, although generally very long (para 2.43, p. 11).

The Ministry of Commerce (1994a) also defines infrastructural assets in terms of networks or systems:

Infrastructure assets can be defined as groups of assets which together form an integrated system. Such a system could not be effectively operated if individual components were removed (para 3.1 p. 5).

The guidelines note that systems typically considered in this context include gas, water; railways and roads as well as electricity distribution systems.

4.4.2 SOLGM Definitions of Infrastructural Assets

In 1989, a working party was formed by the New Zealand Society of Local Government Managers (SOLGM) to help make the transition to the new accountability requirements incorporated in the amendments to the Local Government Act 1974 (Taylor, 1995). The working party developed guidelines for good accounting practice in local government (SOLGM, 1992). Taylor (1995, p. 5) states:

The working party believed the continued application of the concept of “community assets” was inappropriate given the huge investment in those assets and the fact that a large proportion of public debt which appeared in the Statement of Financial Position was raised for the development of community assets.

The working party proposed that all fixed assets should be valued and included in the Statement of Financial Position and adopted the following definition (Taylor, 1995):

Infrastructural Assets: these are fixed utility systems that provide a continuing service to the community, and are not generally regarded as tradeable. They include roads and bridges, water and sewerage services, and stormwater systems (SOLGM, 1992, p. 22).¹⁰

The definition recognises the continual provision of the services of infrastructural assets to the community and also the fact that such assets, in local government, are not generally regarded as tradeable. Smithies (1993) notes that the definition is narrower than other definitions of infrastructure, suggesting that they comprise only those assets associated with utility services such as the roading network, sewerage, drainage and energy provision.

After further development in 1993, the SOLGM working party produced a definition which focussed on the network characteristic of infrastructure assets when forming its definition (Pallot, 1994). Taylor (1995) indicates that the definition was developed to be made applicable to local government while also maintaining a consistency with work being undertaken in other sectors.¹¹ A definition which was neutral across public and private sectors, and relevant to the critical issue of maintaining essential services in serviceable condition was produced (Pallot, 1995). The SOLGM (1994a, pp. 1-2) guidelines define infrastructural assets as:

- 1.1 Infrastructural assets include those stationary systems where the system as a whole is intended to be maintained indefinitely at a specified level of service potential by the continuing replacement and refurbishment of its components. The total system is therefore a network which can include normally recognised 'ordinary' assets as components.
- 1.2 In deciding which ordinary assets should be included within the network it is necessary to determine –
 - (a) whether the particular asset is an integral part of a total system, i.e. if the part was removed would the system be complete
 - (b) what the intended service potential of the system is and whether the part is necessary for the system to meet this potential.

¹⁰ The SOLGM working party also defined two other categories of fixed assets:

Operational Assets: These are tangible assets, able to be dealt with as part of the operating strategy. They include land and buildings, motor vehicles and plant, and furniture and chattels; **Restricted Assets:** These cannot be disposed of because of legal or other restrictions, and provide a benefit or service to the community. They include reserves vested under the Reserves Act, and endowments and other property held in trust for specific purposes. They also include Heritage Assets which can be defined as those assets a community intends preserving because of cultural, historic or environmental associations (Taylor, 1995, p. 6).

¹¹ The SOLGM working party examined studies and publications which had been undertaken in respect of other utility operators. These included draft guide-lines developed in 1993 for the Ministry of Commerce to assist in the calculation of financial performance measures for line businesses in electric power companies, and also the paper prepared by Price Waterhouse (1989) for the Water Services Association in the UK (Taylor, 1995).

- 1.3 Assets not meeting the above criteria are not infrastructural assets and therefore would be recognised as ordinary assets to which the normal accounting treatment applies.

The guidelines give the following typical examples of infrastructural assets in local government:

- roading;
- water supply;
- sewerage and stormwater systems;
- flood control;
- erosion control;
- land drainage.

The guidelines also indicate which assets are considered to be component assets of these networks. For example, component assets of a sewerage system would include pipes, manholes, tunnels, pumps, pump stations and treatment plant.¹² However, non-network assets associated with a sewerage system would include mobile pumps and generators, depots and offices, stores, spare parts, vehicles, and computer equipment (SOLGM, 1994a).

Other typical examples of assets which would meet the SOLGM definition include: gas manufacture and distribution, electricity generation and distribution, and telephone systems (Cooper, 1994). Cooper (1994) points out that the definition is reasonably narrow and excludes other assets which are sometimes included as infrastructure assets, for example, airports, schools, hospitals, and buildings such as town halls or museum, and may or may not exclude some or all, of those assets if they are owned by the private sector.

4.4.3 Indefinite Useful Life

Where infrastructural networks are maintained in perpetuity, or indefinitely, the network as a whole is considered to have an indefinite useful life. Price Waterhouse (1989, para 2.45, p. 11) state that the economic life of an infrastructure network is considered to be indefinite because:

¹² A list of what the SOLGM (1994a) guidelines consider to be typical examples of local government infrastructural asset systems/networks and their components is included in Appendix 2.

- there will always be a duty to supply “clean” water and to dispose of “dirty” water; and
- the networks of systems are needed for this requirement which is recognised under the general duties of water and sewerage undertakers. . .

The notion of infrastructural networks having indefinite useful lives is similarly illustrated by Deloitte Touche Tohmatsu (1995a). The authors note that the main characteristics of ‘infrastructural’ assets which appear to be considered in local government appear to be:

- life span - indefinite or finite
- discrete or network systems

They illustrate examples of these in the following matrix:

Exhibit 2.1: Network vs Discrete and Finite vs Indefinite Lived Assets¹³

	Finite Lives	Indefinite Lives
Network Assets	Bridges (large) Sewerage treatment plants Electricity Generation plants	Roading networks Water reticulation systems Sewerage reticulation systems Electricity reticulation systems
Discrete Assets	Park facilities (grandstands)	Heritage Assets Parks

They note that the distinguishing characteristic of a network is that the network as a whole is regarded as the asset, rather than one individual part of it. Therefore, it may be sensible to acknowledge that the network can consist of two fundamental components:

- an indefinite life component; and
- a finite life component.

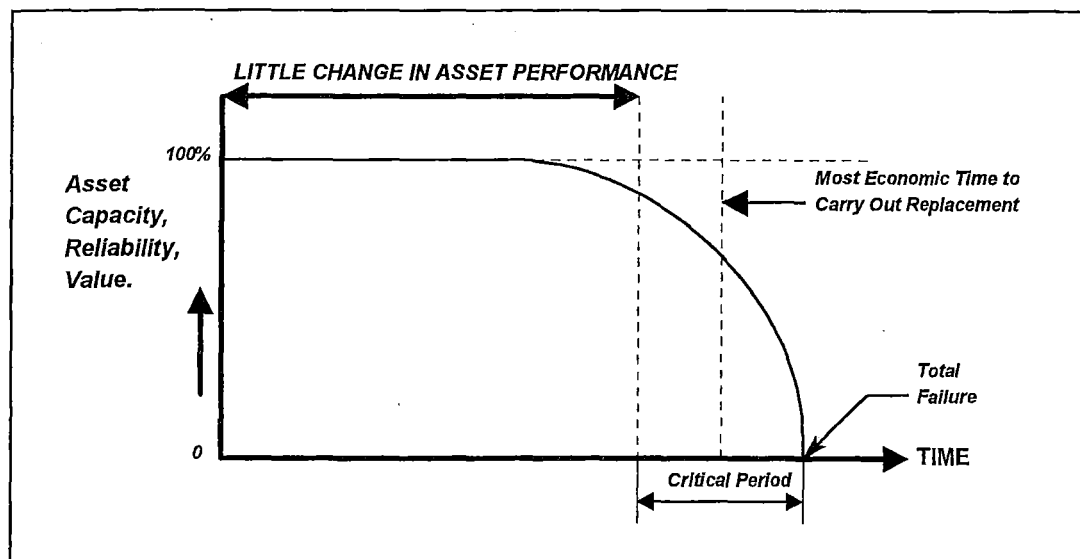
The indefinite life component would consist of that sector of the network where a reasonably consistent level of annual maintenance (including replacement of worn out components) could keep the system in good working order for an indefinite period (Deloitte Touche Tohmatsu, 1995a).

The indefinite useful life of infrastructural assets can be depicted by illustrating their life-cycle. In general, sewerage pipes continue to provide the same level of service for the

¹³ Source: Deloitte Touche Tohmatsu (1995a, p. 5).

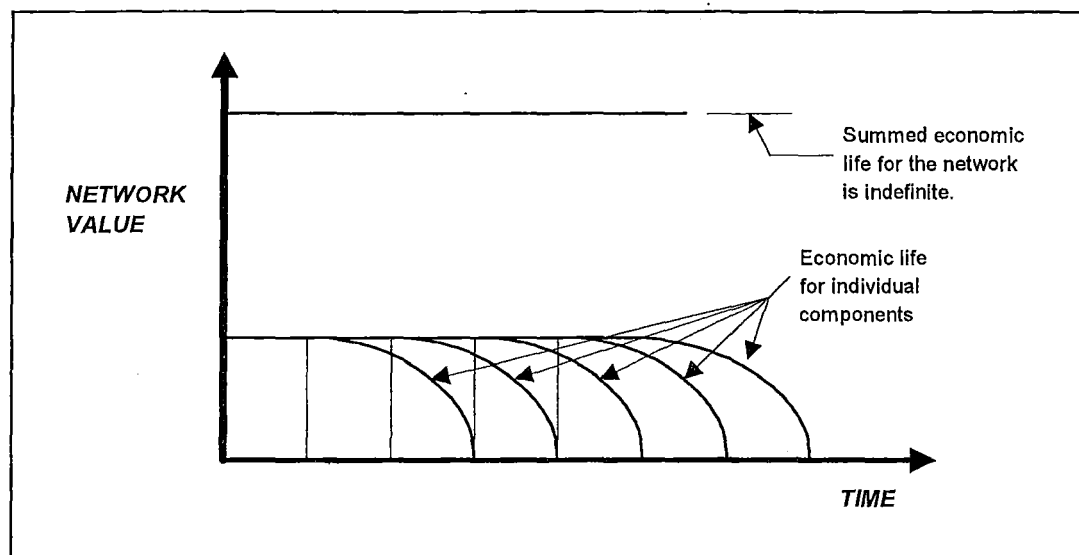
majority of their life but there is a critical period near the end of the life within which the pipeline should be replaced (Davin, 1993).¹⁴ This is illustrated in Figure 2.1 below:¹⁵

Figure 2.1: Pipeline Economic Life



Davin (1993, p. 8) extends the basic idea contained in Figure 2.1 for a network of pipes that are being regularly replaced, as displayed in Figure 2.2 below:

Figure 2.2: Pipeline Network Economic Life



¹⁴ Kearney and Davin (1994, p. 4) indicate that a similar relationship exists for roads: "[m]ost researchers agree that for roads the deterioration relationship is relatively flat for an initial period, and then deterioration begins to increase, growing rapidly once a threshold of conditions is reached."

¹⁵ Source: Davin (1993, p. 7) based on James, G., (1993) "Asset Management Plans: An Overview," Paper for the Society of Local Government Managers Seminar on Strategic Financial Planning, Asset Management Plans, and Taxation Issues, April, p. 6 (also found in James (1994) "Attachment 1: Asset Management Plans," p. 6.). Furthermore, a similar diagram for roads is shown in Hyman, Alfolor, and Allen (1993, p. 19).

The summed economic life for the network is an aggregation of all the individual lives of component assets of the network. Figure 2.2 shows that if the economic life of the individual components is added, then the network has an indefinite life, provided that components of the network are replaced as the need arises.¹⁶ The network's life is indefinite because it depends upon the continual renewal and replacement of component parts. The value of the network, in theory, would remain constant since the network would be expected to be maintained at a defined level of service capacity.

Despite references to infrastructural assets having the characteristic of an indefinite useful life, the meaning of the term "indefinite" is sometimes ambiguous. Depending upon the definition used, the concepts of an 'indefinite', 'infinite' and 'indeterminate' useful life, along with the terms 'maintained in perpetuity' and 'maintained indefinitely', are often intertwined within the definitions and characteristics used to describe infrastructural assets. Furthermore, viewing infrastructural networks as having indefinite useful lives appears to be mixed with connotations of infinite lives. That is, assets which last forever.

The term "indefinite" does not necessarily mean "infinite" (Pallot, 1995). Pallot (1995, p. 9) notes that "there could be circumstances under which not only the individual components but also the whole system ceased to be of use". Parts of an infrastructure network could become obsolete not only because of technical obsolescence due to technological advances, but also because of a decision by the community not to carry on using part of an infrastructural asset. The term indefinite, rather, implies that the life of the network cannot be specified or is uncertain (Pallot, 1995). In regard to the SOLGM (1994a) definition, Pallot (1995, p. 9) states:

Because they provide essential services and are in fixed location, it is not possible to replace the system in its entirety at one point in time. Rather, parts are replaced or renewed on an ongoing basis through time such that the system as a whole cannot be said to have a specifiable life.

It is the network as a whole that is considered to have an indefinite life and not the individual component assets (Seed and Horsley, 1994). This is also clear in the SOLGM (1994a, p. 5) guidelines which state, "the network can be said to have an indefinite useful

¹⁶ Note: Figure 2.2 shows only one asset being maintained indefinitely. The network would include many components, each with different age profiles and curves showing the relationship between deterioration in the condition of the assets and time.

life even though the lives of individual components may be finite". Moreover, the Canadian Institute of Chartered Accountant's Study Group (CICA, 1989) notes that when viewed as a total network made up of components, or a single asset, then an indefinite life for the infrastructural asset is arguable:

For some types of infrastructure assets, it is possible to view the total service delivery system as a single, multi-part asset. For example, the total network of roads in a city could be taken as the asset unit. One could assert that such service delivery systems are expected, with proper maintenance and replacement of parts, to last indefinitely (CICA, 1989, p. 32).

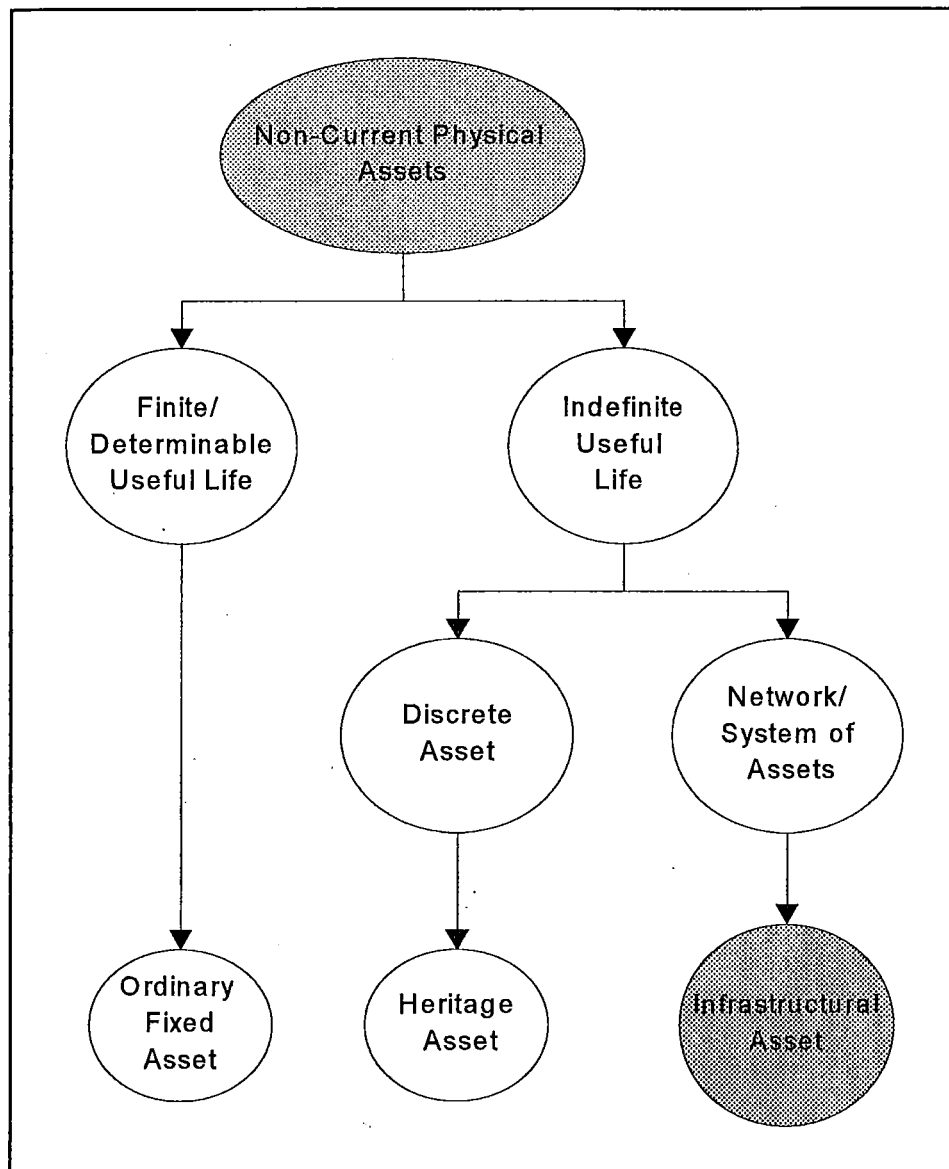
Conversely, a finite life for the network is only determinable when a decision is made to replace the entire network (Kearney and Davin, 1994). However, it is unlikely that entire networks will be replaced at any one foreseeable time (Currie, 1987; Pallot, 1995; Duncan, 1995).

4.4.4 Conclusion

The foregoing discussion has identified infrastructural assets as a conceptually distinct group of assets. They may be defined as "networks or systems of assets which, as a whole, have indefinite useful lives even though individual components will need to be replaced".

Defining infrastructural assets as a conceptually distinct group of non-current physical assets is illustrated by Figure 2.3 on the next page. The differences between ordinary non-current fixed assets with finite lives and those which are infrastructural assets with indefinite useful lives are shown. Discrete assets, such as heritage assets, are also depicted as assets with indefinite useful lives since these are likely to be preserved indefinitely.¹⁷

¹⁷ Note: Heritage assets, like infrastructural assets, are expected to have very long useful lives and are intended to have an indefinite life (Taylor, 1995). Some heritage assets may last hundreds of years. Others may last even longer. Because of their indefinite lives, heritage assets are unlikely to be depreciated but may require expenditure on restoration (Taylor, 1995). In fact, the SOLGM working party (1994b) has prepared draft guidelines in respect of accounting for heritage assets in local government. These propose that SSAP 3 – Accounting for Depreciation (NZSA, 1984) is not applicable to such assets because of the indefinite nature of their lives.

Figure 2.3: Conceptual Distinction Between Classes of Non-Current Assets

For the purposes of identifying and defining a conceptually distinct group of assets, and in the light of other definitions reviewed in this chapter, the SOLGM (1994a) definition appears to be the most useful and operational definition of infrastructural assets currently available. The definition enables a separate classification to be created by applying the criteria of whether an asset is necessary for the system as a whole to function. Furthermore, it recognises the continual maintenance and refurbishment needed for such networks, and also that they can have indefinite useful lives. It also distinguishes between network and non-network assets, and, as already noted, has been developed within the context of local government and is consistent with other sectors.

5. Classification of Infrastructural Assets Enables Renewal Accounting to be Applied

Defining infrastructural assets as a conceptually distinct group of assets provides a useful classification for accounting purposes. As mentioned earlier, the purpose of defining an asset is not only to classify assets with similar characteristics but also to achieve an end purpose and apply specific accounting treatments. Taylor (1995, p. 10) believes that the purpose for creating a separate class of infrastructural assets is to assist in the adoption of recording and accounting methods which:

- allow a true and fair view to be presented of the performance of the entity and allow readers of financial statements to judge the extent to which the infrastructure is being maintained.
- is consistent with and encourages good physical management of the assets.

The SOLGM (1994a) guidelines advocate using renewal accounting for assets which are considered part of the infrastructural network, whereas non-network associated assets should be subject to the normal depreciation accounting treatment. Hence, creating a separate classification of assets enables the renewal accounting method to be applied.

6. Chapter Summary

Despite the lack of consensus and apparent diversity of definitions found in the literature, infrastructural assets can be distinguished as a conceptually distinct group of physical assets. They may be defined as “networks or systems of assets which, as a whole, have indefinite useful lives even though individual components will need to be replaced”. The useful life of the network is not infinite but one which is not easily specified or is uncertain. Based on these characteristics, typical examples of infrastructural assets include: roading, sewerage and water reticulation systems, gas, electricity and telecommunication networks.

When viewed as networks, public sector ownership is not essential for defining infrastructural assets. However, for public sector infrastructural assets, the social dimension of such assets also needs to be considered. In some cases, such assets might also be classed as community assets, having the characteristics of being used directly by the community at large, and those which are non-substitutable and/or non-saleable.

Creating a separate classification of assets, named infrastructural assets, enables alternative accounting methods to be applied, particularly renewal accounting.

Chapter 3

INTERNATIONAL DEVELOPMENTS

1. INTRODUCTION	38
2. CANADA	38
3. THE UNITED STATES	39
4. THE UNITED KINGDOM	40
4.1 <i>Renewal Accounting in the UK Water and Sewerage Industry</i>	40
4.1.1 Long Range Normative Charge	41
4.1.2 Steady State and Initial Backlog Expenditure	41
4.1.3 No Depreciation is Charged	42
4.2 <i>Chartered Institute of Public Finance and Accountancy</i>	43
4.3 <i>Institute of Chartered Accountants in England and Wales</i>	43
5. INTERNATIONAL FEDERATION OF ACCOUNTANTS	44
6. AUSTRALIA	45
6.1 <i>Industry Commission Report</i>	45
6.2 <i>NSW Treasury</i>	46
6.3 <i>Urban Water Research Association</i>	46
6.4 <i>Australian Statement of Concepts SAC 4</i>	47
6.5 <i>AAS 27 Financial Reporting by Local Governments</i>	48
7. CHAPTER SUMMARY	49

1. Introduction

Generally, there is international support for treating infrastructural assets as assets in the financial statements and recognising some form of charge in the operating statement (Simpkins and Jensen, 1995a). However, no consensus is found in the literature on how to best account for infrastructural assets (Simpkins and Jensen, 1995a; Pallot, 1994; Micallef et al, 1994; Rowles, 1992). This chapter discusses international developments in accounting for infrastructural assets, including Canada, the United States (US), the United Kingdom (UK), the International Federation of Accountants, and Australia.

2. Canada

The Canadian Institute of Chartered Accountants (CICA) (1989) recommends that innovative approaches to accounting for the annual consumption or depreciation of government fixed assets be encouraged and developed. Moreover,

It should be possible to devise a method of renewals accounting that provides a measure of the financing consequences of deferring needed maintenance and a measure of expense that is useful for developing cost information and for assessing intergenerational equity (CICA, 1989, p. 62)

The CICA (1989) Study Group outlined renewal accounting as a possible method of accounting for infrastructure systems, such as roads and waterlines, and suggested that it is a good measure of the resources consumed in providing services where a network system is in a “steady state” (i.e. where the system has ceased growing and is maintained at a given size (Rowles, 1992)). The Study Group described the renewals accounting approach for infrastructure as follows:

The approach rests on the assumption that large infrastructure systems tend to mature to a steady state where the annual cost of appropriate maintenance and renewal closely matches annual consumption. Once this steady state is reached, and provided that required renewal is in fact carried out, there is no overall system depreciation. The expenditure on renewal is a good current measure of the resources consumed in providing services. Under the renewals accounting method, it is the actual expenditure on renewals that is charged to operations as an expense rather than depreciation (although depreciation might be charged in the early life of an infrastructure system while it is maturing to a steady state) (p. 61).

Hence, CICA supports the adoption of renewal accounting for the infrastructural assets of governmental entities.

3. The United States

Attmore et al (1989) state that responses to a discussion memorandum issued by the GASB (1987a) (concerning the capital assets of governmental entities), indicated that the main issues highlighted were: deferred maintenance, replacement, financing and maintenance of service levels. Furthermore, for governments, depreciation is an accounting idea with no decision-making usefulness. They argue,

Relevant concepts relating to service value and the capital asset's ability or capacity to carry out the functions of government need to be developed and that information on changes in condition and service capacity as a result of additional capital investments, maintenance activities or the lack thereof, rehabilitation projects, and the like—important information for users of governmental financial reports—should be reported to the public (Attmore et al, 1989, p. 17).

Similar to the recommendation of the CICA's (1989) Study Group, the GASB report supports the further development of accounting methods which report information on asset maintenance, or lack of it, and changes in the service value and condition of infrastructural assets of governmental entities.

More recently, the GASB (1995) issued a preliminary views document suggesting that a governmental entity may determine that some of its capital assets will be maintained and used indefinitely, describing them as "indefinite-lived capital assets". To be classed as an indefinite-lived capital asset, the following criteria need to be met:

- (1) The asset has been identified as being a stationary capital asset or system which is anticipated to be maintained indefinitely at a particular level of service potential by the replacement and refurbishment of its components;
- (2) There is a formal decision by the entity's governing board or legislative body to maintain the asset or asset system in a defined and appropriate level by a program of maintenance and restoration intended to ensure that its useful life will be maintained indefinitely; and
- (3) A capital asset management plan has been approved by the entity's governing board that sets forth the established level of service potential and planned maintenance needed to keep it at that level of service potential. (GASB, 1995, p. 33).

The GASB (1995) states that the amount of planned maintenance (derived in the capital asset management plan), may be charged as an expense for the current period, with a contra-asset account being credited, rather than reporting a charge for the cost of use based on an allocation of historical cost of these assets (i.e. traditional depreciation). Actual maintenance should be charged against the contra-asset account, with the balance

of the account (representing unspent planned maintenance) deducted from the reported value of capital asset.¹

4. The United Kingdom

Several developments in accounting for infrastructural assets have occurred in the UK, most notably within the water and sewerage industry, where renewal accounting has been developed and adopted. Developments elsewhere in the UK include work by the Chartered Institute of Public Finance and Accountancy and also by the Institute of Chartered Accountants in England and Wales.

4.1 Renewal Accounting in the UK Water and Sewerage Industry

In the UK, water and sewerage companies are required to apply renewals accounting to their infrastructure assets when preparing financial reports. The Office of Water Services (OFWAT) is the regulatory authority which issued the Regulatory Accounting Guideline (RAG) 1.02 “Accounting for Current Costs” (OFWAT, 1992). These guidelines outline the “infrastructure renewals accounting” approach used by UK water and sewerage companies. The guideline states that the indefinite life of these assets led to the adoption of infrastructure renewals accounting, in which the measure of consumption of capital is based on the expected actual level of renewal expenditure (OFWAT, 1992).² The renewal accounting policy distinguishes between infrastructure and other assets (Price Waterhouse, 1989).³ Other accounting guidelines concerning renewal accounting for these companies include: guidance notes by OFWAT (1993a, 1993b) and those prepared by Price Waterhouse (1989).

¹ Note: The GASB’s (1995) approach is very similar to the New Zealand Society of Local Government Manager’s working party guidelines (1994a) for infrastructural assets (see Chapter 4, p. 64).

² Price Waterhouse (1989) note that the change in policy has been possible because improved information on the condition and performance of the infrastructure systems is now available. Major engineering reviews were undertaken to enable individual water authorities to prepare Asset Management Plans for both their underground assets and plans for maintaining and improving the other assets which form an integral part of the infrastructure network.

³ Non-infrastructure assets, including above ground assets such as treatment plants, pumping stations and buildings etc, are depreciated in the normal way. However, there have been suggestions that the renewals approach should be extended to all network assets (London Economics, (1992) *International Experience of Private Provision of Water, Sewerage and Draining Services*, Report to the Industry Commission, London, June, cited by the Industry Commission, 1992, p. 107).

4.1.1 Long Range Normative Charge

Because of the lumpy nature of expenditure patterns on infrastructure when components are renewed, the Long Range Normative Charge (LRNC) has been developed by OFWAT (1993a) to help smooth the expenditure on these assets over the long term. It is defined as:

... the amount that must be charged to the Profit and Loss Account each year that is sufficient to keep the entire system of infrastructure assets operating at the required level of effectiveness and therefore at the same level of value to the business as previously (OFWAT, 1993a, p. 2).

The LRNC is derived from averaging the fluctuations in forecast long term investment for infrastructure assets (OFWAT, 1993b). Critical to the determination of LRNC is the categorisation of renewals and maintenance expenditure which uses the REVENGE classification, and distinguishes between the REV (Revenue) element and the ENGE (Enhancement of existing assets, New systems, Growth of existing systems, and Efficiency of projects, i.e. capitalisable elements) element (OFWAT, 1993a). OFWAT (1993a) states that, in principle, the LRNC should include all expenditure of every kind involved in sustaining the system in its present state and protecting it from falling in value.⁴

OFWAT (1993a) argues that the annual charge to the Profit and Loss Account will remain unchanged in real terms, i.e. ignoring price inflation, when the size of the system remains basically unchanged and the standards of operating effectiveness also remain unchanged. Any difference, over or under, between actual spending and the long range charge is included in the balance sheet as either a prepayment or an accrual (OFWAT, 1993a; Price Waterhouse, 1989).

4.1.2 Steady State and Initial Backlog Expenditure

For water and sewerage companies to start using infrastructure renewals accounting, it was necessary to make an assumption about whether or not systems were in a steady state

⁴ OFWAT (1993a, p. 10) states, "This would cover: the cost of renewing any components that fail, for whatever reason, during the period; the cost of planned maintenance of any elements of the system; the cost of emergency repairs to any part system; the cost of that part of any planned improvement or expansion of the system which relates to the otherwise unplanned renewal or maintenance of an existing part of the system; overheads directly associated with the planning and carrying out of the renewals and maintenance".

(OFWAT, 1993a).⁵ The operating standards required within their industry had been rising. Furthermore, there was a backlog of expenditure necessary to bring systems up to a level of operating effectiveness and this needed to be incorporated in the initial Asset Management Plan (OFWAT, 1993a).

OFWAT (1993a) describes what is known as 'Initial Backlog', which represents the amount of accrued renewal expenditure due to work which was not carried out to new standards in earlier periods. Expenditure each year to catch up on the initial backlog is additional to the need for a constant (real) annual renewals charge. The backlog provision is carried forward and is deducted from the carrying amount of the infrastructure assets, while the LRNC appears as an accrual in working capital. Expenditure which reduces Initial Backlog is capitalised, while LRNC expenditure is charged to the Profit and Loss Account (OFWAT, 1993a).

4.1.3 No Depreciation is Charged

No depreciation is charged on infrastructure assets because "the full cost of maintaining operating capability is to be expensed and the networks of systems are required to be maintained in perpetuity and, therefore, have no finite economic lives" (Price Waterhouse, 1989, para 2.10).

OFWAT (1993a) argues that the use of infrastructure renewals accounting and the LRNC is an attempt to determine an appropriate annual charge for the phenomenon known as depreciation, not an attempt to avoid charging depreciation. Furthermore:

The reason for adopting renewals accounting rather than the more conventional depreciation approach is simply because it offers, in the context of the water industry, a way of making the estimations necessary under either method with more confidence than the bald estimation of asset lives produced in the past (OFWAT, 1993a, p. 14).

OFWAT (1993a) note that renewals accounting and depreciation accounting are simply two ways of arriving at, what in principle will be, the same answer. Where a system is in a steady state, the amount of renewal expenditure made to restore the system and to

⁵ OFWAT (1993a, p. 4) states, "Steady state is where a body of assets remains in indefinite equilibrium because its component parts are wearing out and being replaced at a constant rate such that the operational effectiveness and hence value of that body of assets remains a constant in real terms".

maintain it at operational levels will broadly reflect the amount of depreciation that would have been charged under depreciation accounting.⁶

4.2 Chartered Institute of Public Finance and Accountancy

The Chartered Institute of Public Finance and Accountancy (CIPFA, 1990) recommends that a charge for the use of fixed assets should be reflected in the service revenue accounts. Infrastructure assets should be included in the balance sheet at their unamortised cost plus the historical cost of subsequent additions (CIPFA, 1990). Such assets should be accounted for on the basis of amortising this historical cost over the periods expected to benefit from the use of these assets. However, they also note that infrastructure assets, "... for the most part, have no alternative service uses and in many respects can, if properly maintained, be retained in perpetuity" (CIPFA, 1990, p. 11). Furthermore, realisation of infrastructure assets is rarely a practical proposition, and,

The principal concern of management with respect to infrastructure, such as roads, is with maintaining the asset in perpetuity, and this brings forward the prospect of developing a renewals accounting approach through revenue provisions to meet that need (p. 11).

Therefore, the prospect of developing renewal accounting to reflect the way infrastructural assets are maintained in perpetuity and to report an expense related to their use is encouraged by CIPFA (1990).

4.3 Institute of Chartered Accountants in England and Wales

Simpkins and Jensen (1995a) state that, in the UK, the financial reporting group of the Institute of Chartered Accountants in England and Wales (ICAEW) reviewed the accounting standard "SSAP 12: Accounting for Depreciation" for major practical problems. The review noted an increasing trend toward the non-depreciation of buildings in the United Kingdom, and stated:

... others argue that the entity's policy is to maintain certain properties to a high standard through a continuing program of refurbishment and maintenance and consequently the

⁶ This is illustrated by an example provided by OFWAT (1993a), which Deloitte Touche Tohmatsu (1995b, p. 6) summarize as follows:

If we have 5 assets each costing \$100 with a life of 5 years and we have bought a new asset over each of the past five years and will continue to purchase one new asset, and scrap one old asset each year we have reached a steady state for the pool of assets. Using a depreciation approach we will charge the Profit and Loss Account with $5 \times \$100/5$ each year (assuming a nil residual) and will maintain a pool of assets will book values of \$90, \$70, \$50, \$30, and \$10 (assuming purchase and disposal mid year). If we expensed the renewal amount to maintain the steady state, i.e. \$100, the position once the steady state is attained is unchanged.

lives of the properties and their residual values are such that any depreciation charge would be immaterial.⁷

Simpkins and Jensen (1995a, p. 6) point out that “the group expresses the view that this argument is an acceptable reason for not depreciating under SSAP 12 providing the view is validated by a professional valuer from time to time and is sufficiently demonstrated in the financial statements”. Furthermore, they state, “[a]pparently the group accepts the view that refurbishment and maintenance may negate the need for depreciation” (p. 6). Hence, non-depreciation of assets is a form of renewal accounting which expenses maintenance instead of charging depreciation.

5. International Federation of Accountants

The Public Sector Committee Exposure Draft “Proposed Study Definition and Recognition of Assets”, issued by the International Federation of Accountants (IFAC, 1994), concludes that the term “infrastructure assets” provides a useful description of certain assets and forms a basis for further consideration of measurement and reporting issues (Pallot, 1994, 1995). In addition:

The accepted practice of allocating the acquisition cost of a physical asset over its estimated useful life on an arithmetical basis (ie depreciation) may not be sufficiently accurate for financial reporting of very large assets, such as infrastructure assets, which are usually subject to continual material renewal, expansion and abandonment. . . . An alternative to assigning “lives” to network assets is to measure the consumption of their service potential by periodic inspection and assessment of deterioration from a given standard, usually based on operational performance of the system. Such inspections are a necessary part of the management of the operation and maintenance of the network, regardless of financial reporting requirements.⁸

Simpkins and Jensen (1995a) indicate that the study describes two methods of accounting for the loss of service potential of infrastructure other than through ordinary depreciation, and that the second approach, called a deferred maintenance system, is similar to the approach to renewal accounting recommended by the SOLGM’s working party (1994a), (which is discussed further in Chapter 4).

⁷ ICAEW, (1992) “FRAG 2/92 Review for Major Practical Problems of SSAP 12”, cited by Simpkins and Jensen (1995a, p. 6).

⁸ International Federation of Accountants (IFAC), Public Sector Committee, (1994) *Proposed Study Definition and Recognition of Assets*, New York, IFAC Public sector Committee, cited by Simpkins and Jensen (1995a, p. 6).

6. Australia

In an Australian discussion paper on *Financial Reporting by Government Departments*, Sutcliffe et al (1991, p. 69) draw attention to the CICA (1989) Study Group's renewal accounting method and state:

Given that practical difficulties may well arise in measuring the consumption of the service potential of individual infrastructure assets, or groups thereof, it is recommended that the practicality, and impact on the relevance and reliability of financial information, of the CICA study group's "renewals" or "deferred maintenance" approach be further considered. That consideration should include an assessment of the relevance of the assumptions upon which the renewals approach rests to particular classes of assets controlled by departments.

6.1 Industry Commission Report

Additional support for further investigation of the renewal accounting method for infrastructural assets is found in the following report by the Industry Commission (1992): *Water Resources and Wastewater Disposal*. The Industry Commission observed that the UK water industry uses an average renewals charge to smooth out the lumpiness in charges when major parts are renewed (i.e., LRNC). The Commission noted that the problem of determining depreciation schedules is then replaced by one of determining average expected renewals expenditure, and, "forecasting how assets are likely to deteriorate over time increases the complexity of renewals accounting and brings it much closer to a conventional depreciation system" (p. 107). The report also states:

The Commission sees considerable merit in the renewals accounting approach, particularly if applied in its pure form — renewals expenditure is charged up as it occurs rather than on some average basis (p. 108).

Furthermore, although there are problems with lumpiness in charges, the extent of the lumpiness problem is likely to be a function of the size of the networks. That is, "the larger the network, the smaller will be the impact of renewal of individual parts of the system" (p. 108). They concluded that, without further investigation, the Commission is unwilling to unequivocally endorse the introduction of renewals accounting in the Australian water, sewerage and drainage sector, but also that, "through the Australian Water Resources Council, water agencies should further investigate the merits of renewals accounting in the Australian water sector" (p. 108).

6.2 *NSW Treasury*

The New South Wales Treasury (1989) recommends using a provision for “overhaul” maintenance for long lived assets to anticipate the need to carry out non-routine maintenance programs at cyclical intervals. Because overhaul maintenance is lumpy by nature, it is necessary to provide for such expenses by spreading them over the expected life of the non-current asset, similar to depreciation charges. Spreading the anticipated overhaul maintenance costs in this way will:

... ensure that future generations will not have to bear more than their fair share of the costs of maintaining the asset at optimal operating capacity, or to bring a deteriorating asset back to its optimal service capacity (NSW Treasury, 1989, p. 21).

A failure to spread depreciation charges over the expected useful life of the asset and to incorporate such charges in pricing goods and services would “lead to a distortion in intergenerational equity” (NSW Treasury, 1989, p. 16).⁹ The amount of the provision would be spread over the life of the asset and written down as the maintenance is carried out. When maintenance falls due, but is not carried out, the provision for maintenance becomes a provision for deferred maintenance and reduces the value of the asset. This brings to prominence the realisation that future operating and maintenance costs are required on assets, while also providing “more meaningful information to decision-makers and the community about the state of publicly owned assets” (NSW Treasury, 1989, p. 21). Therefore, the NSW Treasury suggests a form of renewal accounting which is similar to the LRNC used in the UK.

6.3 *Urban Water Research Association*

The Urban Water Research Association of Australia (UWRA) observe that UK water and sewerage companies have adopted infrastructure renewals accounting when determining the current cost of infrastructure assets (Dyke, 1992). However, the UWRA argues that a common characteristic of all physical assets held on a long-term basis is that their lives are limited, and that, “their service potential declines over time to a point where it is, for practical purposes, used up or lost” (Dyke, 1992, p. 18). For water industry assets, wear

⁹ This (a distortion in intergenerational equity) occurs when “a non-current asset is expensed in the year of acquisition, penalising current users who are required to finance it, and benefiting future users who had not had to contribute to its initial costs (unless by chance the expected rate of using up the asset in a zero inflation environment mirrors the pattern of loan repayments where a finance loan has had to be raised)” (NSW Treasury, 1989, p. 16).

and tear through physical use is the major factor that contributes to this decline in service potential, with technical and commercial obsolescence also being factors which exist. In particular:

... [The] failure to depreciate assets under [sic] renewals accounting methodology means that the operating statement is not reflecting the depreciation expense and would be misleading and also that the infrastructure resources controlled by a water authority are not correctly stated at the reporting date.

In addition, the treatment as maintenance of costs that should be considered as discrete assets means that there is reduced motivation to unitise assets and that over time the physical and accounting assets can become increasingly difficult to reconcile.

In our view renewals accounting is not an acceptable methodology to account for water industry assets and it is contrary to generally acceptable accounting principles. The useful lives of water industry assets are generally finite and over time the existing assets will be replaced (p. 18).

Therefore, support for the use of renewal accounting is not necessarily widespread in Australia.

6.4 Australian Statement of Concepts SAC 4

Both Rowles (1992) and Paul (1992) argue unequivocally that provisions for deferred maintenance are not consistent with the definition of liabilities and expenses in the Australian Statement of Concepts (SAC 4, Australian Accounting Research Foundation (AARF), 1992).¹⁰

Although provisions for deferred maintenance do not constitute liabilities, an expense because of a failure to carry out required maintenance might be recognised instead. The commentary in the Australian Statement of Concepts SAC 4: *Definition and Recognition of the Elements of Financial Statements* (AARF, 1992, para. 53) illustrates this as follows:

Such "provisions" do not involve a present obligation to an external party, and therefore do not represent liabilities. Although the creation of these "provisions" may reflect the consumption or expiration during the reporting period of service potential or future economic benefits embodied in the property, plant and equipment, recognition of an expense is independent of the anticipated future repair work and would involve an adjustment to the carrying amount of the assets, not the creation of a "provision" which is recognised as a liability. In some cases, the motivation for the creation of these "provisions" may have been the failure by the entity to conduct regular maintenance, repairs and overhauls. However, the failure to carry out such work does not create a

¹⁰ Further criticisms of renewal accounting by Rowles (1991, 1992) are discussed in Chapter 6, in which a detailed analysis of issues with respect to renewal accounting for infrastructural assets is provided.

liability. It may however, necessitate the recognition of an expense, and an adjustment to the carrying amount of the assets to reflect the consumption or expiration during the reporting period of service potential or future economic benefits embodied in the assets.

The SAC 4 commentary (AARF, 1992) discusses the recognition of expenses on assets, including infrastructure assets, such as roads and underground piping, as follows:

If the asset has a finite life – and very few types of assets could be regarded as having an infinite life, the exception being land in most circumstances – the service potential or future economic benefits embodied in the asset will be consumed or will expire and will therefore give rise to expenses. Recognition of expenses in these circumstances is normally by way of systematic allocation procedures over the expected life of the asset (SAC 4, 1992, para. 50).

The commentary states that, conceptually, expenditures relating to long-lived assets give rise to service potential and constitute increases in assets which are normally in the form of additions. Interestingly, however, it also states that the consumption of service potential embodied in the assets which gave rise to the need for maintenance, repairs or overhauls constitutes an expense (SAC 4, para. 51). Furthermore,

... it is acceptable in practice to recognise expenses in respect of periodic maintenance, repairs and overhauls when related expenditures are made, where the result of applying this practice is materially similar to the result of applying the policy [in the above paragraph, para. 51] (para. 52).

In other words, expensing capital expenditure on maintenance is accepted as a short cut, so long as it is materially similar to the total expense and value of the asset reported when additions are capitalised and then expensed over their expected useful life under traditional depreciation (Simpkins and Jensen, 1995a). The commentary therefore appears to be accepting a form of renewal accounting (Simpkins and Jensen, 1995a).

6.5 AAS 27 Financial Reporting by Local Governments

The Australian Accounting Standard AAS 27 “Financial Reporting by Local Governments” (AARF, 1994), rejects the view that depreciation should not be recognised on long lived assets because they do not wear out, and states, “the service potentials of long-lived assets do expire over time, notwithstanding maintenance,” and, accordingly, depreciation on these assets is to be recognised as an expense (para. 45). Moreover, the standard also states that, where a class of depreciable assets is revalued, local governments may:

(b) restate separately the gross amount and related accumulated depreciation of the assets comprising the class of revalued assets (para. 38).

This option, not required by local governments but encouraged in the standard, uses a “grossing up option” and appears to have the purpose of more clearly reporting a depreciation surrogate for the average fraction of the remaining lifetime of a class of assets (Simpkins and Jensen, 1995a). Simpkins and Jensen (1995a) suggest that this approach is one response to a perceived failure of the usual form of depreciation accounting to provide information about the upkeep or renewal of the assets. For example, “such information could show that accumulated depreciation for a particular class of assets was, for example, 75% of the total value of the assets. In other words, the assets as a group are not being maintained at a reasonable level” (Simpkins and Jensen, 1995a, p. 9). Hence, the “grossing up” method is another option for reporting information about infrastructural assets in the financial statements.

7. Chapter Summary

Overall, recommendations concerning accounting for governmental infrastructural assets in both Canada and the US are similar. Both encourage the development of accounting methods which report information on changes in their service capacity and condition, and the extent of maintenance and deferred maintenance on such assets. Therefore, they provide further support for studying and developing a renewal accounting approach for infrastructural assets.

Renewal accounting has been adopted within the British water and sewerage industry and several guidelines have been developed (see Price Waterhouse (1989) and OFWAT (1992, 1993a)). The CIPFA (1990) encourages the prospect of developing renewal accounting to reflect the way infrastructural assets are maintained in perpetuity and to report an expense related to their use. Moreover, the ICAEW's (1992) review observed that there is an increasing trend toward the non-depreciation of buildings in the UK, thus using a form of renewal accounting.

The International Federation of Accountants recognises that infrastructural assets are assets for financial reporting purposes and proposes a ‘deferred maintenance system’ approach, which is similar to the renewal accounting approach recommended by the SOLGM (1994a) working party (Simpkins and Jensen, 1995a).

In Australia, there is support for further investigation of the renewal accounting method, though this is not necessarily widespread. Provisions for deferred maintenance may constitute the recognition of an expense rather than a liability, so long as expensing capital expenditure and the value of the asset reported is not materially different from capitalising and then expensing (as under traditional depreciation accounting) (SAC 4, AARF, 1992). In addition, where a class of assets is revalued, the Australian Accounting Standard AAS 27 (AARF, 1994) provides local government entities with a “grossing up” option.

In conclusion, there is international support for recognising infrastructural assets as assets in the financial statements but no consensus as to an appropriate accounting technique for measuring losses of service potential. Recent international developments have tended to focus on the prospect of using renewal accounting for infrastructural assets. However, despite repeated recommendations for further investigation into the use of renewal accounting, and users’ needs for information about deferred maintenance, there is by no means clear support for replacing traditional depreciation accounting with renewal accounting (Simpkins and Jensen, 1995a). Nevertheless, considerable international support exists for further study of the renewal accounting method for infrastructural assets and therefore a detailed examination is found in Chapters 5 and 6.

While arguments overseas concerning accounting for infrastructural assets have been mainly at the conceptual level, New Zealand has been grappling with the difficulties of accounting for these assets for the past six years at a practical level on a widespread basis (Pallot, 1995). Hence, recent developments in accounting for infrastructural assets in New Zealand local government are discussed in the next chapter.

Chapter 4

ACCOUNTING IN NEW ZEALAND LOCAL GOVERNMENT

1. INTRODUCTION	52
2. FINANCIAL MANAGEMENT REFORM IN NEW ZEALAND LOCAL GOVERNMENT.....	52
3. VALUATION OF INFRASTRUCTURAL ASSETS.....	54
3.1 <i>Depreciated Replacement Cost</i>	56
3.2 <i>Optimised Depreciated Replacement Cost</i>	56
4. ACCOUNTING FOR INFRASTRUCTURAL ASSETS.....	57
4.1 <i>Accounting Concepts and Standards Relevant to Infrastructural Assets</i>	58
4.1.1 Statement of Concepts.....	60
4.1.2 SSAP 28 and SSAP 3	61
4.2 <i>Renewal Accounting Guidelines Proposed for Infrastructural Assets in New Zealand</i>	64
4.2.1 SOLGM (1994a) Renewal Accounting Guidelines for Infrastructural Assets.....	64
4.2.2 Ministry of Commerce (1994a) Renewal Accounting Guidelines	66
5. ASSET MANAGEMENT INFORMATION SYSTEMS, CONDITION MONITORING AND ASSET MANAGEMENT PLANS	68
5.1 <i>Asset Management Plans</i>	70
5.2 <i>Summary</i>	74
6. CHAPTER SUMMARY	74

1. Introduction

This chapter discusses the background to accounting developments for infrastructural assets in New Zealand local government. Firstly, the recent local government financial management reforms are explained. These reforms required the valuation of infrastructural assets for the first time. Consequently, a discussion on the valuation methods for infrastructural assets follows. Next, problems encountered in accounting for these assets are outlined, including a discussion of New Zealand accounting standards and other concepts applicable to infrastructural assets for general purpose financial reporting. This is followed by an outline of renewal accounting guidelines proposed for infrastructural assets in New Zealand. The chapter ends with a discussion on the current state of information on the condition of infrastructural assets, formal asset management information systems and asset management plans, all of which are necessary for New Zealand local authorities to enable condition monitoring, proper management and accounting for such assets.

2. Financial Management Reform in New Zealand Local Government

Before the 1989 financial management reforms, local authorities traditionally prepared their annual financial statements on a cash accounting basis, with the emphasis on accountability for funds (Pallot, 1995; Audit Office, 1993b). Fixed and infrastructural assets were not valued or disclosed in the financial statements, nor was depreciation on most assets recognised as a cost (Pallot, 1995; Audit Office, 1993b).

The reform of New Zealand public sector accounting was part of a comprehensive programme of public sector management reform, with the objective of improving the performance of the public sector (McCulloch and Ball, 1992).¹ In general, the local government reforms had two broad objectives:

- to improve the management of publicly owned resources; and

¹ General public sector financial management reform has taken place in many countries around the world (Shand, 1994), and New Zealand is considered a leader in terms of financial reporting on a full accruals basis at the government level as a whole (van Zijl, 1994b; Shand, 1994).

- to achieve a higher standard of accountability to the public at the political and managerial levels in the use of those resources (Hoskin, 1994; Audit Office, 1991, 1993b).

Reorganisation in 1989 resulted in a new local government structure. Many local authorities were amalgamated, reducing the number from in excess of 700 organisations to 85, including 72 territorial and 13 regional councils (Pallot, 1995). New Zealand local government consisted of the following councils in 1994 (Local Government Group, 1994):²

12 regional councils; and

74 territorial authorities comprising:

- 15 city councils;
- 58 district councils;
- 1 county council (Chatham Islands County Council).

Provisions in the Local Government Amendment Act (No.2) 1989 reformed the financial reporting requirements for New Zealand local government entities.³ Section 223E requires councils to prepare the following financial statements:

- a statement of financial position;
- an overall operating statement;
- one operating statement in respect of each significant activity; and
- a statement of cashflows.

One of the major requirements is to prepare financial statements in accordance with generally accepted accounting practice (GAAP) (s223F). These changes mean a shift from cash accounting to full accrual accounting (Pallot, 1995),⁴ requiring the reporting of all the assets of local government entities, including infrastructural assets, in the statement

² Other entities which make up the structure of local government include community boards and special purpose authorities. Community boards are advocates on behalf of their communities and a means by which a territorial authority can consult with the community (Statistics New Zealand, 1996). There are only a handful of special purpose authorities, including: scenic and recreation boards, airport authorities and single purpose entities, such as the Auckland Regional Services Trust (New Zealand Business Roundtable, 1995).

³ The principal sections of the Local Government Amendment Act (No.2) 1989, which reformed local government financial reporting and concern accountability, include the following:

- the conduct of council affairs (s223C), requiring councils to conduct their affairs in an open and comprehensible way, to establish clear objectives and policies, and also to introduce the requirements for the measurement of performance;
- an annual report to the public concerning plans (s223D), requiring councils to prepare an annual plan of programmes and budgets, and to provide for consultation with the community in this process;
- an annual report to the public concerning performance (s223E), requiring councils to report to the public on their performance against the annual plan in both financial and non-financial terms (which must be audited); and
- requirements for the financial systems of councils (s223F), requiring councils to adopt financial systems which are consistent with generally accepted accounting practice. Furthermore, this section requires local authorities to show all of their assets in a full and complete manner.

⁴ See the Statement of Concepts (NZSA, 1993, para. 5.5) for a description of the accrual basis of accounting.

of financial position. However, particularly in the early years of reporting balance sheet values and depreciation by local authorities, there has been a lack of GAAP concerning the valuation and depreciation of infrastructural assets (Pallot, 1992b; Audit Office, 1992).

3. Valuation of Infrastructural Assets

Although councils were, in general, quickly able to identify, value and report fixed assets, the identification, valuation and reporting of infrastructural assets presented much more difficult problems (Audit Office, 1993b; Pallot, 1994). Many of the assets were being valued for the first time and presented a range of complex problems (Cooper, 1994). Major issues which arose included:

- the physical identification of assets
- establishing the physical condition of assets
- the level of deferred or overdue maintenance
- [the] lack of historical data
- determining the appropriate basis for valuation (Cooper, 1994, pp. 2-3).

There was no generally accepted methodology for valuations and obtaining valuations involved significant costs (Audit Office, 1993b).

Initially there was doubt about whether infrastructural assets would be included in the financial statements and some local authorities resisted the requirement to value these assets (Audit Office, 1994a). Local government managers in these local authorities argued that a value was irrelevant for these assets because they were either not saleable or not likely to be sold and that the costs of valuation outweighed the benefits (Pallot, 1994).

The attitude of many councils has since changed and many now argue that valuing infrastructural assets yields the following benefits (Pallot, 1995, p. 5):

- a) It makes readers of the statements aware of the size of the public investment in infrastructure for which the council is responsible.
- b) It puts into perspective the on-going cost which the council incurs in maintaining and replacing infrastructure.
- c) The process of valuing requires that councils clearly identify the existence, location and condition of infrastructural assets with the result that local government managers and councillors improve their knowledge of the council's infrastructure investment.

- d) Annual information about the value of infrastructure is a first step in tracking trends in infrastructure value over time and using that information to hold councils accountable for the way that they manage infrastructure.⁵

It is now generally accepted that these assets have a value and the majority of local authorities have now valued all of their infrastructural assets and included them in their statements of financial position (Pallot, 1994, 1995; Duncan, 1995, Audit Office, 1994a). However, there is doubt about the benefit of trying to have too precise valuations or of having regular revaluations (Pallot, 1994, 1995). The valuation approach adopted will therefore depend on the information which is relevant to users of financial statements, the cost of these valuations, and what is required by generally accepted accounting practice (Pallot, 1994).

In 1992, the NZSA made the following announcement:

The definition of *fixed asset* in SSAP-28, *Accounting for Fixed Assets*, applies to public sector assets such as roads, drainage schemes, art collections, etc (usually called infrastructure and heritage assets), even though there may currently be no generally accepted valuation methodologies for such classes of assets (NZSA, 1992c, p. 68).⁶

The announcement indicated that valuations other than fair value, net realisable value, or recoverable amount, would be accepted, provided they met certain conditions (Pallot, 1994, p. 7).⁷ The SOLGM "Guidelines for Good Accounting Practice" (1992) suggested that, "depreciated replacement cost appeared to be the most appropriate valuation method pending the development of a recognised practice over time. If actual cost is known, or is lower, SOLGM recommended that [cost] should be used" (Pallot, 1994, p. 8). Indeed, the majority of councils do value their infrastructural assets on a depreciated replacement cost

⁵ The most significant infrastructural assets in New Zealand local government include: roading networks, including bridges; kerbs, channels and footpaths; sewerage systems; water supply systems; drainage systems; landfill sites; and flood control works (Audit Office, 1993b, p. 32).

⁶ SSAP 28 (NZSA, 1991, para. 3.3) defines fixed assets as non-current tangible assets that:

Are held by an entity for use in the production or supply of goods and services, for rental to others, or for administrative purposes and may include items held for the maintenance or repair of such assets; and have been acquired or constructed with the intention of being used on a continuing basis; and are not intended for sale in the ordinary course of business.

⁷ To be in accordance with SSAP 28, the NZSA stated that the valuation should be prepared as far as possible in conformity with the New Zealand Institute of Valuers' Standards. The valuation should be prepared by people with demonstrable knowledge and experience and be independent from the entity which owns the asset. For in-house valuations, the valuation should be reviewed by a second independent and qualified person and confirmed as appropriate. Moreover, in the opinion of the governing body of the entity, the valuation should be sufficiently reliable for the purposes of users of the financial reports of the entity. Furthermore, emphasis was to be given to relevance over reliability (NZSA, 1992c; Pallot, 1995).

basis.⁸ Therefore, depreciated replacement cost seems to be becoming generally accepted valuation practice for infrastructural assets.

3.1 Depreciated Replacement Cost

In a report by the Controller and Auditor-General (see Audit Office, 1994a, p. 33), depreciated replacement cost (DRC) was described as: “the cost of replacing an asset less a fraction of the cost equal to the fraction of the lifetime of the asset which has elapsed”. Furthermore, the following example was provided:

A bridge might cost \$6 million to replace. If it has an expected life of 50 years and is now 15 years old, its depreciated replacement cost would be:
 Replacement cost—(replacement cost x 15/50)
 = \$6, 000, 000 - \$1, 800, 000
 = \$4, 200, 000 (p. 33).

The replacement cost value of an asset is the current cost of purchasing another asset that yields the same stream of services as the asset in question is capable of providing (SOLGM, 1994a; Ernst & Young, 1994). However, replacement cost does not take into account whether the services that can be provided are in fact required and whether the value attaching to those services would justify their replacement (Pallot, 1995; SOLGM, 1994a; Ernst & Young, 1994).

Pallot (1995) argues that DRC is not entirely appropriate for public sector infrastructural assets because they have no potential profitability. The SOLGM guidelines address this problem by stating that, where the test of adequate potential profitability is not available, then, “DRC should be expressed as having regard to the prospect and viability of the continuance of the service potential and use” (SOLGM, 1994a, p. 8).

3.2 Optimised Depreciated Replacement Cost

The SOLGM (1994a) guidelines state that when the DRC basis of valuation is used, because of its limitations, valuers should also report an optimised depreciated replacement cost (ODRC) for comparative purposes, unless explicitly absolved from doing so by the instructing council. ODRC is defined as:

⁸ In their 1994 annual reports, 53 councils (out of a total of 84 councils who valued their infrastructural assets) indicated that they used a depreciated replacement cost valuation basis for their infrastructural assets (Pallot, 1995).

...the cost of replacing existing assets with modern equivalent assets. The concept of modern equivalent assets is one of optimising the existing assets that enable the most cost efficient and effective approach to providing the current level of services to be achieved (SOLGM, 1994a, p. 7).

Moreover,

ODRC measures the cost of replicating the asset in the most efficient way possible, given the asset's service capability at the age of the existing assets. The valuation is built up as a sum of the values of individual asset groups (p. 8).⁹

Nevertheless, ODRC also has limitations. Pallot (1994, 1995) argues that it is unnecessarily complicated and expensive, and also less reliable, and, therefore, DRC valuations for infrastructural assets may be a close enough approximation. Furthermore, precise valuation in the local government sector is "considerably less important than in the commercial sector where return on assets is a significant measure of performance" (Pallot, 1995, p. 12). Therefore, for infrastructural assets, where technology is not rapidly changing (e.g. roads), as opposed to infrastructure where technology is changing quickly (e.g. telecommunications), DRC may be adequate for valuing infrastructure when looked at from a cost benefit point of view (Pallot, 1995, 1994).

4. Accounting for Infrastructural Assets

Simpkins and Jensen (1995b, p. 20) state that, while initial problems of recognition and valuation of infrastructural assets have mostly been resolved, acceptable approaches for accounting for changes in service potential are still being debated.

Problems relating to the ordinary or traditional depreciation accounting approach for infrastructural assets have become evident since the 1989 reforms (Smith, 1995). Some of these problems included:

- Lack of identification of assets led to combinations or globalisation of assets, as opposed to looking at each component of an asset network.
- Difficulty in determining whether additions were capital or expense items.
- Difficulty in assigning "useful lives" to assets when those assets formed part of network that had an indefinite life.

⁹ Note: These valuation principles (contained in the SOLGM (1994a) guidelines) are a summary of those followed in the development of a valuation methodology for public sector assets, which are included in the New Zealand Institute of Valuers' (NZIV) Asset Valuation Standards and Guidance Notes (SOLGM, 1994a, p. 7). Therefore, they are consistent with the requirements of the NZSA's announcement (1992c), where asset valuations should be prepared as far as possible in conformity with the NZIV's Standards (refer to footnote 7, p. 55). (Note: For further detail regarding asset valuation principles for infrastructural assets, see: Cooper (1993, 1994); Seed and Horsley (1994); Ernst and Young (1994); Horsley (1993); Stuart (1992); Paul (1992); and Rae (1992)).

- Huge variations in valuations upon which the depreciation was calculated (Smith, 1995, pp. 1-2).

There is considerable diversity among local authorities in the accounting policies for infrastructural assets, as illustrated from their 1994 and 1993 annual reports in Table 4.1 below.

Table 4.1: Accounting Treatment of Infrastructural Assets by Local Authorities¹⁰

ACCOUNTING TREATMENT	No of Councils using that treatment:	
	1994	1993
Conventional depreciation on all assets	27	31
Some assets not depreciated	2	6
No depreciation	2	10
A mixture of depreciation and maintenance	31	14
Maintenance only	16	20
Annual revaluations	1	1
Depreciation less maintenance expenditure	0	1
TOTAL	84¹¹	83¹²

Many local authorities have opted against using conventional methods of depreciation in favour of a renewal accounting approach. Consequently, there are advocates for both methods of accounting in respect of infrastructural assets (Smith, 1995). The diversity in practice among local authorities and lack of GAAP suggest that there is need for a financial reporting standard in this area (Pallot, 1995).

4.1 Accounting Concepts and Standards Relevant to Infrastructural Assets

As already discussed in Chapter 1, the literature on infrastructural assets identifies the need for an accounting approach which produces information on the extent to which infrastructural assets are being maintained, any deferred maintenance, and which encourages good management practice. Consistent with this need, Simpkins and Jensen

¹⁰ Source: Pallot, J., (1995) "Infrastructure Accounting for Local Authorities: Technical Management and Political Context", Paper prepared for the annual *AAANZ Conference*, La Trobe University, Melbourne, Australia, 9-12 July, p. 7.

¹¹ The total number of councils is 85, 84 of which had valued some or all of their infrastructure assets in June 30, 1994 annual reports (Pallot, 1995, p. 5).

¹² For the remaining two councils, one had not valued its infrastructure assets in 1993 and one stated that it had no infrastructure assets (Pallot, 1995, p. 7).

(1995a, p. 2) assert that the objectives of a good accounting policy for infrastructural assets will:

- Enable users of the financial statements to judge the performance of management in maintaining infrastructure and determine the extent to which infrastructure is being maintained;
- Provide sufficient information on the costs, efficiency and service performance of the service provider to aid monitoring by regulatory agencies and facilitate competition where that is possible; and,
- Encourage good management of infrastructure assets.

... subject to the constraints that:

Such a policy must:

- Provide benefits which exceed its costs; and,
- Be consistent with generally accepted accounting practice (GAAP).

The concept of intergenerational equity is also a particularly relevant issue with respect to infrastructural assets; for example, where there is long term deferral of maintenance and/or large replacements of infrastructure. Intergenerational equity can be defined as:

An equitable relationship between current-year revenues and the cost of services provided in the year. If the current generation is not absorbing the full cost of services, it is in effect running down the capital provided by previous generations. Alternatively, if the current generation is absorbing more than the full cost of services, it is building up capital as a benefit to future generations (CICA, 1989, p. 101).

Simpkins and Jensen (1995a, p. 19) state that, although it seems fair for today's ratepayers to pay the full cost of today's services, ratepayers dislike councils accumulating large cash reserves. Furthermore, it is possible under both traditional depreciation and renewal accounting for annual reported expenses to be more than the same year's cash outlays. However, the authors point out that for local authorities, depreciation on infrastructure is the most significant source of non-cash expenses. To reconcile this problem, they suggest applying "surplus" cash (from reported non-cash expenses) to the repayment of council debt. Asset replacements in the future could then be funded by way of debt without increasing the council's average leverage, and therefore avoid cash reserves being built up (where councils are debt-holders, Simpkins and Jensen, 1995a, p. 19).

Accounting policies proposed for infrastructural assets should therefore provide information which achieves the above objectives and enables an assessment of whether or not intergenerational equity is being maintained.¹³

4.1.1 Statement of Concepts

Any accounting approach developed for use in general purpose financial reports will need to be consistent with the NZSA's Statement of Concepts for General Purpose Financial Reporting (1993; see Pallot, 1995).

The Statement of Concepts (NZSA, 1993) provides four qualitative characteristics for evaluating the quality of information provided in financial reports (see NZSA, 1993, para. 4). They are also useful for selecting and evaluating accounting policies (Barton, 1982; Sutcliffe, 1985), and are briefly described as follows:

- *Relevance*: Information is **relevant** to users if it can be used to:
 - (a) confirm or correct prior expectations about past events (feedback value); or
 - (b) assist in forming, revising or confirming expectations about the future (predictive value).
- *Understandability*: Information is **understandable** when users might reasonably be expected to comprehend its meaning.
- *Reliability*: Information is **reliable** when it:
 - (a) corresponds with the actual underlying transactions and events (representational faithfulness);
 - (b) is capable of independent verification (verifiability); and
 - (c) is free from bias (neutrality).
- *Comparability*: Information in a financial report is **comparable** when users are able to identify similarities and differences between that information and information in other reports.

The Statement of Concepts (NZSA, 1993, para. 6) also provides scope for a balance between the above qualitative characteristics, in which a trade-off between characteristics may be necessary to meet the objectives of general purpose financial reports. There is also a constraint on the balance between benefits derived from, and the costs of providing, information. Furthermore, materiality and prudence (conservatism, or the need to exercise care when dealing with uncertainties), are also factors which influence the above qualitative characteristics.

¹³ For further discussion on the concept of intergenerational equity see: Musgrave and Musgrave (1984, pp. 99, 693); Herzlinger and Nitterhouse (1994, p. 823); Henke (1987); Pallot (1989, pp. 329-330; 1990b, p. 83); SPSAC (NZSA, 1987); Reid (1983); and, similarly, the concept of "interperiod equity", a term coined by the GASB (1987b, pp. 21-22, 32), which expresses the concept of equity between years as opposed to equity between generations (CICA, 1989, p. 101).

4.1.2 SSAP 28 and SSAP 3

Traditional depreciation accounting for fixed assets is required under SSAP 28 and SSAP 3. SSAP 28 (NZSA, 1991, para. 5.10) provides that depreciation on revalued fixed assets should be charged in accordance with SSAP 3. Under SSAP 28 (NZSA, 1991), expenditures which are expected to increase the service potential of a fixed asset are capitalised and expensed to future periods in which the benefits are derived. Repairs are expensed in the period in which they occur.

Pallot (1995) notes that SSAP 28 and SSAP 3 caused particular difficulty when accounting for infrastructural assets in New Zealand local government. In regard to SSAP 3, “local government managers argued strongly that infrastructure systems provided essential services and had an indefinite life, although individual components did wear out and require replacing” (Pallot, 1995, p. 3).

SSAP 3 defines depreciation as:

... the wearing out, consumption or other loss of value of an asset whether arising from use, effluxion of time or obsolescence through technological and market changes. It is accounted for by the allocation of the depreciable amount of a depreciable asset over its useful life (NZSA, 1984, para 3.1).¹⁴

However, Simpkins and Jensen (1995a) state that the definition of depreciation in SSAP 3 is somewhat different from the Statement of Concept’s definition of “expenses”. Similarly, Pallot (1995, p. 13) states, “indeed it is by no means clear that a cost *allocation* is an expense as defined in the *Statement of Concepts*”.

The Statement of Concepts (NZSA, 1993, para. 7.22) defines expenses as:

Consumptions or losses of service potential or future economic benefits in the form of reductions in assets or increases in liabilities of the entity, other than those relating to the distribution to owners, that result in a decrease in equity during the reporting period.

¹⁴ SSAP 3 states that a depreciable asset is an asset which —

- is expected to be used during more than one accounting period, and
- has a limited useful life, and
- is held by an enterprise for use in the production or supply of goods and services, or for administrative purposes (NZSA, 1984, para. 3.3).

Useful life is defined as either —

- (a) the period over which a depreciable asset is expected to be used by the enterprise; or
- (b) the number of production or similar units expected to be obtained from the asset by the enterprise (NZSA, 1984, para. 3.4).

The consumption or loss of service potential must be probable and able to be measured with reliability (NZSA, 1993). Simpkins and Jensen (1995a, p. 3) state that the SSAP 3 definition speaks of “consumption or other loss of value of an asset”, whereas the Statement of Concepts speaks of:

... consumptions or losses of service potential or future economic benefits in the form of reductions in assets or increases in liabilities of the entity.

Therefore, they argue, “the Statement of Concepts defines the general idea of ‘loss of value’ of an asset to be situations in which *service potential or future economic benefits* have been lost or consumed”. Hence, accounting methods, other than allocations of cost, which produce reliable measures of losses of service potential will be consistent with the Statement of Concepts.

Further difficulties are apparent in the application of traditional depreciation accounting to infrastructural assets. Pallot (1995, p. 13) argues that it is apparent from the literature on infrastructure assets that the information which the public require most is the degree to which assets have been consumed through use, and that:

Although essential services should probably be maintained continuously at the required level, it is quite apparent that such maintenance does not always take place. In the long run, delay in needed infrastructure maintenance increases the costs of providing services and results in intergenerational inequities. The question is whether conventional depreciation (the allocation of the cost of an asset over its useful life) is the best means of measuring such resource consumption (1995, p. 13).

She notes that two problems emerge. First, the term “depreciation” has a number of connotations¹⁵ and, that if anything, the notion of depreciation as a cost allocation is declining in importance given the shift from cost-based to value-based elements in the statement of financial position (p. 13).¹⁶ Second, as also advocated in a number of earlier writings (see Pallot, 1990a, 1994):

... even if depreciation was understood to be a decline in value due to consumption of the asset’s service potential, conventional depreciation may not be an adequate reflection of

¹⁵ Depreciation has many different meanings and conveys a host of different concepts. Pallot (1995) indicates, for example, that Goldberg (1960) identified four concepts of depreciation including: depreciation as a fall in price; depreciation as physical deterioration; depreciation as a fall in value; and depreciation as a cost allocation. Similarly, Pick (1970) identified six major components of depreciation.

¹⁶ Peirson and Ramsay (1994) identified two broad approaches to the concept of depreciation: depreciation as a process of allocation of cost or some other value, and depreciation as a process of valuation. Furthermore, they state that there is nothing in the Australian Statement of Concepts’ (SAC 4, AARF, 1992) definition of expenses or recognition criteria for expenses (which is the same as the NZSA’s Statement of Concepts (1993) definition of expenses), which precludes the use of either an allocation or a valuation approach to depreciation for measuring consumptions or losses in service potential (p. 72).

economic reality. Straight line depreciation is unlikely to coincide with physical deterioration and even depreciation methods which try and reflect economic service potential focus on use of assets rather than consumption as such. The standard of maintenance affects an asset's efficiency and life but depreciation in accounting will probably not match engineering based figures. Using an asset does not necessarily mean using it up while deterioration may result from abuse as well as use. . . . It [depreciation] is very unlikely to be a close approximation for large infrastructure assets for which valuation is controversial and useful life cannot be readily determined (Pallot, 1995, p. 13).

Pallot (1995, p. 13) concludes, "[a]rguably, what is needed is an accounting approach which focuses on whether or not the maintenance required is being performed". This highlights the prospect of developing an acceptable form of renewal accounting for infrastructural assets, which produces reliable measures of losses of service potential and is consistent with the Statement of Concepts.

4.1.2.1 NZSA Revision of SSAP 3 & 28

Van Zijl (1994a) notes that the NZSA needs to develop accounting prescriptions on the valuation, measurement, and possible depreciation of infrastructural assets, and that consideration will need to be given to the acceptability of renewal accounting.

The relevant existing accounting standards, SSAP 3 and SSAP 28, are currently being revised and merged together to form one financial reporting standard (FRS) (NZSA, 1995).¹⁷ Any revised standard or standards will apply to infrastructure assets, whether they are held by local authorities or by other entities (Simpkins and Jensen, 1995b). Thus, the NZSA's revision of existing standards on fixed assets and depreciation presents an opportunity to specifically accommodate infrastructural assets (Pallot, 1995), and recognise a form of renewal accounting acceptable for general purpose financial reporting. However, any method proposed will need to be in accordance with GAAP.

The Local Government Law Reform Bill 1994, currently before Parliament, is poised to make further amendments to the Local Government Act 1974, and give legislative meaning to GAAP (similar to the way it is defined in the Public Finance Act 1989 and Financial Reporting Act 1993) (Audit Office, 1996). Under s223F(3), this means that local authorities' financial statements will have to comply with:

¹⁷ An exposure draft of the revised standard was expected to be available sometime in 1995 (NZSA, 1995). Yet, at the time of writing (October, 1996), it had not been released but is expected to be available in late 1996 (Baskerville, 1996).

- (a) Approved financial reporting standards (within the meaning of section 2 of the Financial Reporting Act 1993) so far as those standards apply to local authorities; and
- (b) In relation to matters for which no provision is made in such approved financial reporting standards and which are not subject to any applicable rule of law, accounting policies that—
 - (i) Are appropriate to the local authority; and
 - (ii) Have authoritative support within the accounting profession of New Zealand.

Therefore, as the Audit Office (1996, p. 39) states, “while local authorities have so far accepted GAAP as being best practice, clarification of what GAAP means for them will have implications for the way they report in the future”.¹⁸

4.2 Renewal Accounting Guidelines Proposed for Infrastructural Assets in New Zealand

In New Zealand, there have been two guidelines formulated with respect to renewal accounting for infrastructural assets: (1) renewal accounting guidelines for infrastructural assets in New Zealand local government, issued by the Society of Local Government Manager’s working party (SOLGM, 1994a); and (2) the Ministry of Commerce guidelines (1994a) for renewal accounting for electric power companies.

4.2.1 SOLGM (1994a) Renewal Accounting Guidelines for Infrastructural Assets

A working party of the New Zealand Society of Local Government Manager’s (SOLGM) (1994, p. 5) has issued draft guidelines which recommend that councils adopt a “renewals accounting approach and Asset Management Plan” approach for infrastructural assets with indefinite lives.

The SOLGM working party, which included public and private sector representatives from the accounting, auditing, engineering and valuation professions, as well as local government managers, was formed in late 1993 to further develop guidelines on accounting for infrastructure assets (Pallot, 1994). The working party attempted to address problems identified in accounting literature and in practice, while maintaining consistency with the NZSA’s (1993) Statement of Concepts (Pallot, 1995). Pallot (1995, p. 17) states:

¹⁸ Note: Once FRSs are submitted to, and approved by, the Accounting Standards Review Board (ASRB), they have legal backing under the Financial Reporting Act 1993 and, therefore, compliance is required by legislation (Simpkins, 1994; van Zijl, 1994b).

By bringing together different professions to work on interdisciplinary problems, the SOLGM working party reached agreement that depreciation should be understood as resource consumption, the central problem being to measure that in a meaningful way as possible.

Moreover,

... the legal requirement for local authorities to consult with their communities and to publish long term and annual plans presented an opportunity to link technical questions for accounting with political processes (p. 17).

The SOLGM working party concluded that the amount spent in a cash accounting renewals approach might not bear much relationship to the actual condition of the assets, and sought an approach which would encourage good management of infrastructural assets (Pallot, 1994, 1995).

The guidelines recommend a deferred maintenance approach to renewal accounting for infrastructural assets.¹⁹ Non-network associated assets should be subject to the normal depreciation treatment. The guidelines assume annual depreciation on network assets to be zero due to infrastructural assets being maintained in perpetuity. A network can be said to have an indefinite useful life even though the lives of individual components may be finite.²⁰ The guidelines state that depreciation is generally less appropriate to record loss of service potential as it is less accurate than Asset Management Plans.

For assets considered part of the infrastructural network, the following accounting treatment is proposed (para. 3.1):

- (a) The Asset Management Plan budget for a period to restore the asset to its required operational capacity is considered as a surrogate for the depreciation expense of the asset for the period and as a measure of the loss of service potential.
- (b) As expenditure on restoration is made, this expenditure restores the service potential of the asset. In the ideal theoretical situation, the budget in paragraph (a) above and the expenditure on restoration will be equal and the operational capacity of the network will remain unchanged. The restoration expenditure is expensed.
- (c) Any shortfall in restoration work (deferred maintenance) is considered as a surrogate for the depreciation provision carried forward and is recorded as an expense and as a deduction on the balance sheet from the gross value of the asset. Note that this shortfall is established in relation to the physical restoration to be achieved; such a shortfall could occur for any of the following reasons:
 - Insufficient money expended to permit the work to be performed.
 - Insufficient work performed even though the budget amount of money was expended.

¹⁹ A detailed examination of the deferred maintenance approach to renewal accounting follows in Chapter 5.

²⁰ The criteria which the SOLGM (1994a) guidelines state are necessary for an indefinite useful life are outlined in Chapter 5, on p. 85.

- Inaccuracies in the asset management plan that become clear as restoration work proceeds.
- (d) When expenditure is incurred that makes up the shortfall, that expenditure is treated as a deduction from the deferred maintenance previously allowed for and is not further expensed.
- (e) It is important that where significant change is agreed in the requirements for operational capacity of the infrastructure system or significant components, the change and its financial consequences are explained in narrative in the financial report.

Implicit in this renewals approach is that there is no reason for loss of service potential. Restoration expenditure may not be uniform from year to year and it is possible that major fluctuations could occur.

As Asset Management Plans develop, the extent and timing of fluctuations will become apparent. It may be necessary then to make adjustments to the renewals policy to provide a smoothing effect.

The guidelines also state that councils should establish their own policy on renewals, which in turn should be stated in their external reports. The policy should include any provision to be made to smooth any abnormal fluctuations. For example, it may be necessary to adopt an annualized charge for certain major components of networks (SOLGM, 1994a, para. 3.2). Catch-up of any substandard condition of any part of the network which is revealed by the AMP is also an issue to be dealt with in the policy. Moreover, the time period allowed for this catch-up should be included and must be affordable and achievable (para. 3.2).

4.2.2 Ministry of Commerce (1994a) Renewal Accounting Guidelines

The Ministry of Commerce (1994a) has also published guidelines which provide the option of using renewal accounting for infrastructural assets. There is a concern that electricity power companies (EPCs) sometimes expense the replacement and refurbishment of many of their fixed assets, and at the same time depreciate those assets (Pallot, 1994). Where this occurs, the total expense (including depreciation) will often exceed the true economic costs relating to the use of those assets (Ministry of Commerce, 1994a). The guidelines state:

In order to ensure that profits are appropriately defined for performance measure purposes, directors and auditors [must] certify that the financial performance measures have been calculated from financial information prepared in accordance with the information disclosure regulations. In particular they would need to certify that depreciation and expenditure that has the effect of maintaining the service potential of the asset, have not both been expensed for the same asset. This will ensure that profits are measured reliably

and consistently over time, and will facilitate yardstick comparisons of profitability between EPCs' line businesses (Ministry of Commerce, 1994a, p. 1).²¹

The guidelines suggest that there are two ways of meeting this requirement; through renewal accounting and through full depreciation accounting, as prescribed in SSAP-28 (NZSA, 1991). They state that renewal accounting, in broad terms, involves expensing the costs of replacement and refurbishment of infrastructure assets, and, provided it can be demonstrated that 'service potential' is being maintained, these assets are not depreciated (Ministry of Commerce, 1994a, p. 1).

The guidelines are not prescriptive and allow EPCs a degree of flexibility in the treatment of individual asset types. Full depreciation accounting is acceptable, provided its application does not embody any double counting of expenses. In addition to avoiding the possibility of double counting expenses, renewal accounting is expected to result in greater consistency between line businesses' financial performance measures and also in lower compliance costs than for other alternatives (p. 1).

Key characteristics of the form of renewal accounting adopted in the guidelines are:

- EPCs exercise a degree of choice in determining which line business assets are designated infrastructure and which are non-infrastructure. . . . Whilst EPCs can determine the initial allocation between infrastructural and non-infrastructural assets, once specified these classifications should remain unchanged.
- The infrastructure assets once chosen are treated as a single asset.
- For the infrastructure assets:
 - replacements are expensed and no depreciation is charged provided overall service potential is being maintained.
 - additions which enhance network service potential are capitalised.
- For non-infrastructure assets, both replacements and additions are capitalised and depreciated using market (or reasonable proxy) values and economic (not tax) lives. Replaced assets are written-off (Ministry of Commerce, 1994a, p. 3).

The guidelines also state:

The renewal accounting approach . . . is most applicable to that part of networks or systems where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components . . . [and] is most effectively applied where the system is in a mature and steady state . . . (p. 5).

²¹ Simpkins and Jensen (1995a, p. 4) note that, although the guidelines are designed to assist electricity distributors comply with the information disclosure regime, for regulatory rather than general purpose financial reporting purposes, the aims of the information disclosure requirements appear to be consistent with those of general purpose financial reports (see NZSA, 1993, para. 3.1).

Where a system is more or less in a steady state, expenditure made to maintain the system indefinitely at a certain level of service potential is considered to be a satisfactory measure of the loss of service potential (p. 7).

5. Asset Management Information Systems, Condition Monitoring and Asset Management Plans

A review of 85 city, district and regional councils by the Audit Office in 1993 found that:

- Three-quarters of councils have little or no reliable knowledge of the condition of the entire range of their infrastructural assets;
- Other than for roading, few councils had reliable and objective assessments of the condition of sewerage, water supply or drainage system assets. There is a lack of formal information systems to monitor the condition of these assets; and that
- Because of the lack of systematic monitoring, elected members are not receiving regular and comprehensive reports about the condition of infrastructural assets (Audit Office, 1993b, p. 7).

The review indicated that most councils had introduced a formal planning and monitoring system for roading networks, known as the Road Assessment Maintenance Management (RAMM) system, and that, due to Transit New Zealand's requirements,²² almost all councils have a good knowledge of the condition of their roading network.

On the other hand, the review indicated that, for sewerage, water and drainage infrastructural assets (often referred to as pipelines or reticulation assets), procedures and systems to monitor asset condition have been piecemeal and not developed as part of a coordinated and formal process (Audit Office, 1993b). Most councils cannot reliably assess the condition of their reticulation assets (Audit Office, 1993b). However, councils are generally aware of the lack of information and most of them have taken steps to introduce more formalised systems of asset management or have indicated their intention

²² The Audit Office (1993b, p. 32) stated that Transit New Zealand requires councils to provide detailed information on the costs of roading programmes, together with other quantitative and qualitative information, and that it also regularly inspects and assesses roads and the way roading programmes are administered.

Transit New Zealand is a Crown owned entity which is responsible for the control and management of state highways. It provides financial assistance to local authorities for local roads and public passenger transport, contributing funds for approximately half of the costs associated with the local roading network in New Zealand (approximately 85 000km) (Source: Transit New Zealand Profile (pamphlet), Transit New Zealand, Wellington, undated but obtained by the author in September 1995).

to do so (Audit Office, 1993b). Moreover, many authorities are poised to introduce asset management plans (Audit Office, 1993b).²³

A follow-up review by the Audit Office in 1995 revealed that the lack of information and formal systems to monitor the condition of reticulation assets persists (Audit Office, 1995). The condition of infrastructural assets is still not reliably known by councils. However, it was noted that most councils had made considerable progress in identifying and establishing a detailed inventory of their infrastructural asset networks, which is necessary before their condition can be assessed (Audit Office, 1995).

Most territorial authorities have now subscribed to the Pipeline Asset Management System ("PAMS") for pipeline infrastructural assets (Audit Office, 1995; Smith 1995). An initiative by the Association of Local Government Engineers in New Zealand, PAMS is being developed and coordinated nationally among local authorities to find an optimal asset management system (Audit Office, 1995). The software for PAMS has an extensive facility to allow monitoring of asset condition (Smith, 1995).²⁴

The Audit Office (1995) also indicated that local authorities are making progress in preparing asset management plans, but:

Such plans cannot be developed without a detailed knowledge of the assets and an effective database system in which the information is recorded. Most asset management plans are therefore at an embryonic state, and are being developed hand-in-hand with better identification of the asset networks (Audit Office, 1995, p. 21).

The relationship between asset management information systems (RAMM and PAMS) and asset management plans is depicted in Figure 4.1 on the next page.

²³ In addition, a number of developments were noted during the reviews, including: the use of video inspections of pipes; hiring engineering consultants to assess requirements and options; the use of Geographic Information Systems (GIS) to accurately and comprehensively record reticulation lines; the use of sophisticated alarm systems to instantly notify faults; and computer diagnostic systems for the operation of plant (Audit Office, 1993b, p. 33).

²⁴ Note: Smith (1995) states that, particularly in New Zealand local government, the difficulties in assessing asset condition, aside from the usual logistical problems in checking sunken assets, involve the need to get common standards for field inspections, fault recording, condition attributes and ratings, weighting these factors and summarising the condition into an overview of the whole network. This information will become apparent as local authorities implement PAMS and collect the information needed on their pipeline assets. Then measures can be developed which will enable asset condition to be monitored. Smith (1995) notes that an optimal situation would be to have a "score-card" for an asset network, which is akin to a financial rating by a credit agency. However, he states that this is a theoretical concept and is years away from reality.

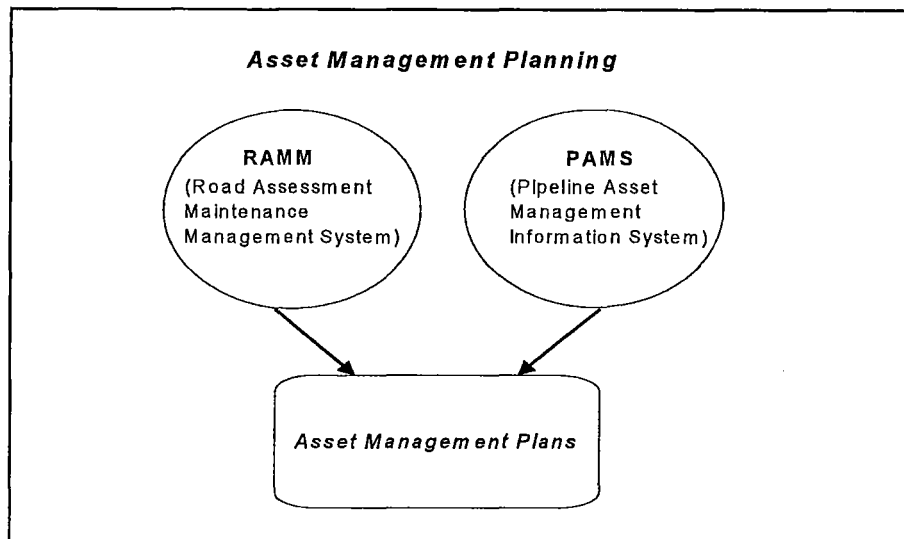
Figure 4.1: Asset Management Information Systems and Asset Management Plans

Figure 4.1 illustrates that the asset management planning process relies on the input of information from such information systems to produce an asset management plan for each respective infrastructural asset.²⁵

5.1 Asset Management Plans

The importance of asset management plans for the management of infrastructural assets is apparent. An asset management plan (AMP) can be defined as:

An asset management tool in which a combination of management, financial, engineering and other practices are applied to physical assets in pursuit of economic life-cycle costs (James, 1994, p. 1).

A life-cycle approach to asset management identifies procedures for use, maintenance, acquisition, and disposal of assets (Audit Office, 1993c). AMPs are concerned with optimising life cycle costs, which include:

The cost of ownership associated with acquiring, using, caring for and disposing of infrastructural assets, including feasibility studies, research, development, design, construction, maintenance, replacement and disposal. They also include the support, training and operating costs generated by these activities (James, 1994, p. 2)

The Audit Office (1995, p. 25) suggests that an AMP should address the following issues:

- Why the asset system is owned and managed (rationale for ownership).
- What the assets are and where they are (description, location and value).
- What functions the assets are intended to perform (operating capabilities).

²⁵ Furthermore, the Audit Office also pointed out that higher standards of treatment, particularly for wastewater (due to the impact of the Resource Management Act 1991), will be required in many areas before new resource consents can be obtained. Therefore, new or improved infrastructure will be required, with estimates of expected costs in the range of \$2 000 million upwards over the next 10-20 years (Audit Office, 1995, p. 23).

- How well the assets are performing (systematic measurement of performance).
- What is needed to keep the assets performing to expectations (maintenance plans).
- How the existing assets will be retired (disposal plans).

The Audit Office has also suggested ten points with respect to AMPs. An AMP should (see Smith, 1995, pp. 16-18):²⁶

1. Define the level of service or performance required of the asset.
2. Define the time frame over which the asset will be able to deliver the required service (maintain in perpetuity or defined life cycle).
3. Fully describe the asset.
4. Prescribe the maintenance expected over the time frame.
5. Provide mechanisms to measure performance of assets against preset parameters over the life of the system.
6. Include financial information on forecasts of expected maintenance costs for at least the ensuing three years.
7. Ensure under-maintenance or deferred maintenance is recognised by recording shortfalls in the financial statements in the year which such shortfalls relate.
8. Be prepared by qualified persons.
9. Be a firm commitment of the Council – be approved or adopted by the governing Board or Council.
10. Be periodically reviewed and updated to ensure the plan fits changing circumstances.

A 20 year time horizon is often proposed for AMPs (see Hall, 1995; OFWAT, 1993a; Law, 1992; and Currie, 1987). However, this period may be longer or shorter. James (1994) suggests that the period over which the life-cycle costs are assessed and incorporated into the AMP is not necessarily linked with any accounting period, nor the total life-span of the asset. Rather, it is more related to the time of acquisition of the asset and when the asset is no longer needed or replaced.

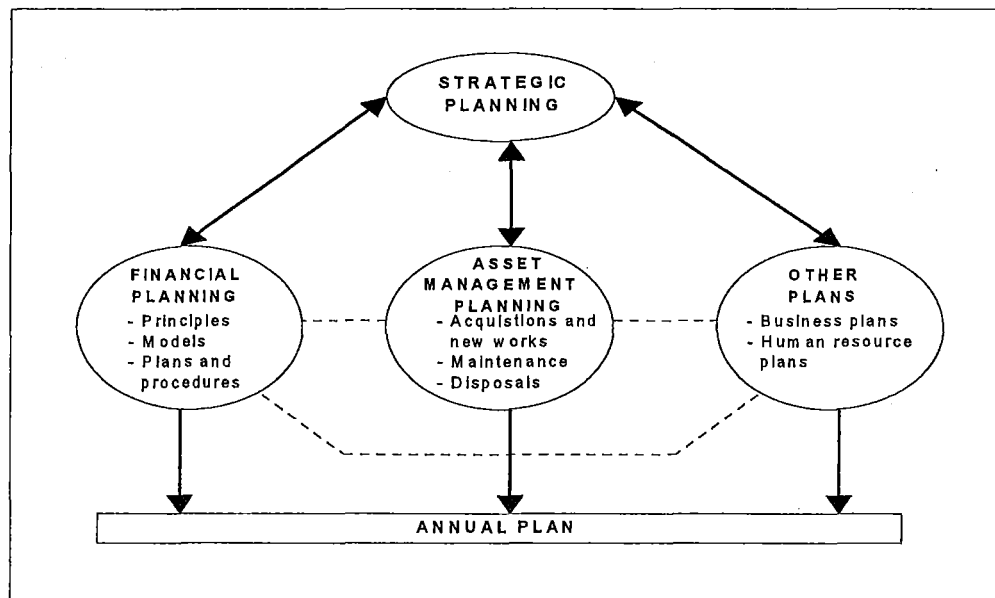
Hall (1995) states that, theoretically, the AMP should cover the period necessary to include one full cycle of replacement of the longest live major assets. Yet, this could be up to a hundred years for pipeline assets (Hall, 1995). Estimation of costs this far into the future is clearly not feasible nor realistic (Hall, 1995). Hall (1995) indicates that Watercare Services Ltd prepares AMPs on a 20 year time horizon.²⁷ He notes that even over a twenty year period, years eleven to twenty are less reliable and detailed than years one to ten. In particular, technological change is impossible to assess for the later years in the AMP (Hall, 1995).

²⁶ For more detail on the contents of AMPs, refer to both Appendix 3 and James (1994), and also Smith (1995).

²⁷ Watercare Services Ltd is a local authority trading enterprise which controls bulk water and sewerage infrastructural assets and provides services to the local authorities in the Auckland region.

Similarly, Smith (1995) asserts that it is unrealistic to provide detailed financial information on future maintenance costs. Cost estimates which are more than two to three years in the future are really only guesses (Smith, 1995). Smith (1995) suggests that, in the short-term, there needs to be much more precision on what work is required so that this can be adequately costed. For example, over a three year period, he proposes that this might best be accomplished by a supplement to the AMP, which would be updated on a rolling basis (in essence, a “working document” (p. 11)). The supplement would provide a detailed breakdown of all the work to be performed in the next three years, identify individual tasks, and estimate costs for each of these tasks. This would be prepared with the involvement of financial personnel and would be interfaced with the annual plan and any other planning document of the Council.

AMPs should be linked with the long-term strategic, financial and other plans of the organisation. Links between asset management and strategic financial planning are strong and unavoidable, because infrastructural assets have long lives relative to other types of assets (James, 1994). Strategic planning may be defined as “the process for defining the mission and goals, and developing strategies and plans to meet the mission and goals” (Audit Office, 1994b, p. 29). They are long term plans which need to be developed in consultation with the community, integrate all activities of the authority, and be consistent with other plans and policies affecting the community, such as resource management plans (Audit Office, 1993b). The relationship between AMPs and strategic plans, as well as other long term plans, is depicted in Figure 4.2 on the next page.

Figure 4.2: Asset Management Plans in the Context of Long Term Planning²⁸

Once AMPs are fully developed, they are expected to yield many benefits relating to the management of infrastructural assets. James (1994, p. 10) indicates that AMPs can be used to achieve the following:

- identify the costs of bringing maintenance and replacement up to date.
- provide a basis for assessing whether assets are being adequately managed within the aims and objectives of the organisation.
- provide a basis for evaluation of the appropriateness of the level of service, since the level of service being provided by the asset managers to the asset beneficiaries is defined by the asset management plan.
- provide a benchmark for performance assessment and measurement, of both the asset and the managing organisation.

Furthermore, the Audit Office (1993c, p. 34) has suggested that an AMP helps to ensure that:

- There are procedures and policies in place which, when followed, will result in consistently good asset management throughout the organisation.
- The organisation can assess its ability to meet its physical asset needs through present funding and can take action now to prevent future problems.
- The management of physical assets is consistent with, and linked to, the strategic plan.
- Costs related to physical assets are properly documented and reflected in the costs of outputs.

Although AMPs are a prerequisite for the use of renewal accounting, they are essential to the management of any organisation with infrastructural assets, irrespective of the accounting mechanism adopted (Smith, 1995; Simpkins and Jensen, 1995a). Organisations using traditional depreciation accounting also need to manage their

²⁸ Source: Adapted from Figure 2: Schematic Diagram of Long-Term Planning, Audit Office, (1994b) *A Guide to Monitoring the Financial Condition of Local Authorities*, Wellington, March, p. 28.

infrastructural assets in the long term. In any case, AMPs may be difficult to avoid given the long term financial management and planning principles proposed in the Local Government Law Reform Bill 1994 (Smith, 1995), which will require ten year financial strategies to be prepared by regional and territorial local authorities. To produce these strategies, councils will have to have an AMP for all of their infrastructural assets (Simpkins and Jensen, 1995a).

5.2 Summary

In summary, the Audit Office (1995) acknowledges the extensive work being undertaken by local authorities, which will eventually allow better management of infrastructural assets. The main elements of this work are:

- detailed identification of assets and their condition
- recording and analysis of the information
- preparation of asset management plans (Audit Office, 1995, p. 23).

Meanwhile, the most pressing issue is, undoubtedly, to push ahead with systems to manage and monitor infrastructural asset systems (Audit Office, 1995). Furthermore, the Audit Office (1995) concludes that New Zealand local authorities are at the forefront of better asset management. They are tackling the enormous and complex task of preparing long-term management plans for their infrastructural assets. Moreover, if present progress is maintained, then within two to three years, reliable information on both deferred maintenance and expected future replacement costs should be produced.

6. Chapter Summary

Given the recency of requirements for New Zealand local government entities to account for their infrastructural assets, GAAP is still developing. It appears that the depreciated replacement cost valuation method is becoming accepted practice. However, there is considerable diversity in the accounting practices among local authorities for measuring losses of service potential. Local authorities are using a variety of accounting approaches for their infrastructural assets and there is need for a financial reporting standard in this area. Any accounting method proposed for infrastructural assets will need to be consistent with the Statement of Concepts (NZSA, 1993).

Accounting approaches proposed for infrastructural assets should meet the objectives of a good accounting policy for such assets and enable an assessment of whether intergenerational equity is being maintained.

Methods, other than allocations of cost, which produce reliable measures of losses of service potential, will be consistent with the Statement of Concept's definition of expenses. The current revision of accounting standards by the NZSA presents an opportunity for a renewal accounting approach to be incorporated within a revised financial reporting standard (Pallo, 1995). This financial reporting standard will apply to infrastructural assets of both public and private sector entities.

Renewal accounting has been proposed as an alternative to ordinary depreciation accounting for infrastructural assets and is becoming more widely accepted and adopted by New Zealand local authorities. Renewal accounting guidelines have been developed by the SOLGM (1994a) working party and by the Ministry of Commerce (1994a) in an attempt to measure losses in service potential via maintenance charges rather than allocations of cost.

New Zealand local authorities are at the forefront of better asset management and are making progress in implementing formal asset information systems (i.e. PAMS) for planning, managing, and monitoring the condition of their infrastructural assets. Information on the condition of infrastructural assets, particularly pipeline assets, is needed before AMPs can be prepared. These plans form an important input into an organisation's overall strategic, financial and other long term plans. They are needed to manage infrastructural assets, irrespective of the accounting method adopted.

Chapter 5

RENEWAL ACCOUNTING

1. INTRODUCTION	78
2. THE CASH ACCOUNTING APPROACH	79
2.1 Replacement Accounting Condemned and Obsolete.....	80
2.2 Replacement Accounting - Leaves Too Much Scope For Manipulation	80
2.3 Maintenance and Renewal Expenditure May Not Equal Loss of Service Potential	82
2.4 Conclusion	82
3. THE DEFERRED MAINTENANCE APPROACH	83
3.1 Infrastructural Asset Network is a Single Asset.....	84
3.2 Indefinite Useful life	85
3.3 Only Applied to Network Assets - Non Network Assets Are Depreciated	86
3.4 No Depreciation is Charged	86
3.5 Basis for Distinguishing Revenue and Capital Expenditure Needed.....	87
3.5.1 Operational Definitions of Revenue vs Capital Expenditure.....	87
3.5.2 Proportional Allocation Between Revenue and Capital Expenditure.....	89
3.6 Provisions for Deferred Maintenance are Made Where Necessary.....	90
3.6.1 Complications with Provisions for Deferred Maintenance.....	91
3.7 A Steady State is Assumed and Reporting Loss of Service Potential Accurately	93
3.7.1 Lumpiness in Expenditure Patterns on Infrastructural Assets	94
3.7.2 Renewals Holiday	95
3.8 Asset Management Plans	96
4. CHAPTER SUMMARY	97

1. Introduction

Renewal accounting is a general term which focuses on renewals and assumes that the system as a whole has an indefinite life even though individual components wear out. Some versions of renewal accounting may be more acceptable than others (Pallot, 1994, p. 19).

Renewal (or renewals) accounting has been described by a myriad of terms in the accounting literature, including: 'renewals accounting', 'infrastructural asset accounting', 'infrastructural accounting', 'infrastructure accounting', 'maintenance accounting', and 'replacement accounting'. Renewal accounting has its origins in the practice of replacement accounting by railroad companies in the nineteenth century. It has been used for many years in the American rail industry (Rowles, 1992; CICA, 1989), the British rail industry (Rowles, 1992; Edwards, 1986; Gourvish, 1970), in Australia for rail and tramway tracks (Rowles, 1992), and, more recently, in the British water industry (OFWAT, 1993a; Law, 1992; Price Waterhouse, 1989; Currie, 1987).

In broad terms, renewal accounting assumes that infrastructural assets can have indefinite useful lives if they are properly maintained (Pallot, 1994). Expenditures on maintenance and renewal of assets are expensed. No depreciation is charged as occurs with the normal way fixed assets are accounted for. There are two broad approaches to renewal accounting. One is essentially a cash accounting approach, where all expenditures on maintenance and replacement of assets are expensed as they occur (Pallot, 1994). The other is the deferred maintenance approach. This assumes that the infrastructural asset network is a single asset, which is maintained in perpetuity, and that the network as a whole has an indefinite useful life. It attempts to recognise decreases in the condition of an infrastructural asset and as long as the infrastructure asset is renewed, the deferred maintenance reported is zero (Pallot, 1995; Audit Office, 1994a). Where maintenance is deferred for some reason, the cost of this is deducted from the gross value of the asset in the balance sheet. Renewal accounting is applied most effectively where asset systems are in a steady state. An essential prerequisite for using the deferred maintenance approach to renewal accounting is the operation of an asset management plan (Pallot, 1995; Audit Office, 1994a).

The purpose of this chapter is to examine the various forms of renewal accounting found in the academic and professional accounting literature. First, the cash accounting

approach to renewal accounting, as practiced in the form of replacement accounting in the nineteenth century, is discussed. Second, the deferred maintenance approach to renewal accounting and its relevant assumptions are examined.

2. The Cash Accounting Approach

Nineteenth century British and American railway companies had considerable freedom in accounting for their assets (Brief, 1966). The practice of expensing maintenance and renewal costs, instead of providing for depreciation, was employed by most railroads and utilities in the United States and Great Britain in the nineteenth century (Brief, 1965). Edwards (1986, p. 252) states:

Throughout the nineteenth century, there existed a widespread presumption that, provided the fixed assets of railway companies were properly looked after, they possessed an unlimited physical life or, at least, that the replacement date was sufficiently remote to be ignored. Where this view prevailed, companies accounted for fixed assets on the 'repairs and renewals' basis. Other companies, which recognised the fact that fixed assets eventually wore out, combined repairs and renewals accounting either with the creation of a 'depreciation fund' or with the explicit practice of charging replacements directly against revenue when they occurred.

Railroad managers argued that depreciation was an irrelevant concept since regular maintenance and replacement would cause the permanent way (railway track) and rolling stock (locomotives and carriages) to last indefinitely (Most, 1982). Such an approach seemed simple and appeared logical, "there was a certain logic in the contention of railroad men that adequate renewal of parts would keep the equipment up to standard operating efficiency" (Littleton, 1933, p. 233).

The practice of expensing all renewals and replacements as they occurred was commonly known as replacement accounting (Gourvish, 1970; Brief, 1966), which is a modification of strict cash accounting (Brief, 1965, 1966).¹ Brief (1965, p. 15) states:

Under replacement accounting, all expenditures on maintenance, repairs, and renewals (replacements) were charged directly to expense. Expenditures on additions and betterments, i.e. capital expenditures, made with funds provided from the proceeds of stock and bond issues or revenue were capitalised.

¹ Retirement accounting is similar to replacement accounting (Brief, 1966). The difference is that, in replacement accounting, the cost of the assets replaced are expensed, whereas, in retirement accounting, the cost of the equipment is withdrawn from the plant accounts when the equipment is retired and charged to retirement expense (Troxel, 1947, p. 338).

The essential difference between cash and replacement accounting is that replacement accounting charges expenditures on additions and betterments to capital. Otherwise, both methods produce similar results (Brief, 1966). There were, however, many variations of replacement accounting in practice (Edwards, 1986; Chatfield, 1974). Some railway companies debited capital with renewals; some charged only betterment to capital; and some charged renewals to revenue (Pollins, 1957).

2.1 Replacement Accounting Condemned and Obsolete

Replacement accounting was generally condemned by accountants and others at the time (Brief, 1966). For example, one nineteenth century accountant condemned the charging of all replacements as they occur against revenue, stating:

... the practice of railway companies ... [is] a practice as vicious and full of temptation to managers and directors to manipulate accounts for their own ends and purposes as can well be imagined. It is, in fact, little short of an inducement to fraud.²

Replacement accounting is now considered obsolete (Reid, 1983; Brief, 1966). Edwards (1986) states that, in the early years of the present century, railway companies began to make provisions for depreciation. This was because it had become evident, from experience, that no amount of maintenance could prolong indefinitely the useful life of a fixed asset (Edwards, 1986). Assets would eventually decay with use. Furthermore, the practice of charging expenditures as expenses had the effect of ignoring the problem of obsolescence (Littleton, 1933).

Two major criticisms of replacement accounting are: (1) its scope for flexibility and manipulation in practice, and (2) that renewal and replacement expenditures may not equal the consumption of service potential.

2.2 Replacement Accounting - Leaves Too Much Scope For Manipulation

The adoption of replacement accounting had some logical appeal (Brief, 1966), especially in providing opportunities to manipulate profits and ensure stable dividends over time. There were obvious attractions in its use since it made the expense of maintenance and replacement a discretionary item (Most, 1982). Replacement accounting was very simple

² *Accountant*, (1885) November 14, p. 30, cited by Brief (1966, p. 4).

and extremely flexible in practice, giving managers a wide range of accounting discretion (Chatfield, 1974; Brief, 1966; Pollins, 1956). It avoided the problem of forecasting the useful lives of long-term assets (Chatfield, 1974, Brief, 1966). It also enabled higher profits to be made and, because the original capital investments created no charges to expense until they were replaced, railroads appeared as attractive investments in their formative years when they most needed capital (Chatfield, 1974; Brief, 1966).³

Replacement accounting has been called an inherently unstable form of cash accounting (Brief, 1965; Chatfield, 1974). The amounts spent on maintenance and charged against revenue were apt to fluctuate widely (Chatfield, 1974). Two problems associated with its application include: first, depreciation associated with the original plant is not recognised until the assets are replaced, and second, the distinction made between replacements and additions has a significant influence on profits (Brief, 1965). In many cases renewals and replacements might have been deferred or treated as additions (Brief, 1965). Pollins (1956, pp. 339-340) indicates that the flexibility in the treatment of items of expenditure naturally lent itself to fraudulent management: profits could be increased (and therefore dividends raised), by debiting capital with expenditures which should have been expenses; and vice versa.⁴ Moreover, the distinction between different types of accounting methods for capital expenditure was often blurred and non-disclosure of accounting policies made it easier to switch between accounting methods, depending on managerial objectives (Edwards, 1986). Additionally, the absence of precise definitions, and the interchangeable use of terms such as renewal and replacement, complicate an evaluation of contemporary accounting practices in the nineteenth century (Edwards, 1986).

³ In fact, May (1936, pp. 340-341) believed that the application of periodic-cost depreciation, instead of replacement accounting, during the rapid development of American railroads, would have greatly delayed development, and perhaps some construction might never have occurred at all. He added, however, that "[i]t is no doubt true that as a result of accounting methods followed, large amounts of capital have been lost by investors" (p. 341, cited by Brief, 1965, pp. 19-20), (nearly half of the track mileage constructed in the U.S. before 1900 was ultimately placed in receivership (Brief, 1965, p. 20)).

⁴ Furthermore, Pollins (1956) suggests that replacement accounting may have been used to more easily maintain dividends. Many railway directors, as well as shareholders, wished to have regular dividends and the final entries in the accounts may very well have been influenced by a desire to have stable, rather than fluctuating, earnings and dividends (Pollins, 1956).

2.3 Maintenance and Renewal Expenditure May Not Equal Loss of Service Potential

Another problem associated with replacement accounting is that expenditure on maintenance may not equate with depreciation. In the early years of the working of a railway, there is the risk of not having sufficient renewal and replacement expenditure to balance depreciation (Matheson, 1893). Matheson (1893, p. 2) suggests that only when the undertaking is so large and permanent that it affords "... a wide average of deterioration and renewal" or when many years of operations have arrived at an average rate of expenditures, will repairs and renewals balance depreciation.

Similarly, the need for a wide average of deterioration and a constant rate of renewals to equal depreciation is advocated by Dewing (1953, p. 574), who suggests that continual maintenance may equal depreciation where property meets the following conditions:

1. It must be easily divisible into small parts.
2. The parts must be uniform, that is, all of a kind.
3. The number of such parts must be very large in the aggregate amount.
4. The parts must be of such a nature that the repair or replacement of any one of the parts does not affect the usefulness or the life of the property as a whole.

In short, "... the property must consist of many uniform, distinguishable and physically separate units" (Dewing, 1953, p. 574). Dewing (1953) indicates that the roadbed of a large railroad system meets these conditions. Similarly, large utility systems of local authorities such as water, sewerage, drainage, and roading systems appear to meet the above conditions which assume an asset system in a steady state.⁵

2.4 Conclusion

The foregoing discussion provides useful insight into the problems of expensing renewal and replacements as they occur under a cash accounting approach to renewal accounting. These approaches were unstable and permitted very flexible accounting practices. Through replacement accounting, profits could be manipulated, enabling stable dividends to be paid.

Problems associated with the use of replacement accounting appear to be related to unclear accounting policies and the lack of a clear distinction between capital and renewal

⁵ The steady state assumption is discussed in more detail later in this chapter (see p. 93).

expenditure. In addition, the possibility of renewal and replacement expenditure on assets not equating with depreciation was identified. For renewal accounting to equate maintenance and renewal expenditure with depreciation, asset systems need to be in a steady state. That is, where there is a constant rate of maintenance and renewals expenditure.

Replacement accounting is very similar to cash accounting in the way that renewals and replacements are expensed as they occur. However, cash accounting renewal methods are not consistent with NZSA's (1993) Statement of Concepts (Pallot, 1995). Under these forms of renewal accounting, it is possible for any type of expenditure to be expensed, regardless of whether they increase the capacity of the network or not. Such methods are, therefore, inappropriate for financial reporting purposes and measuring the consumption of service potential.

3. The Deferred Maintenance Approach

The forms of renewal accounting being promoted in New Zealand today are different from the cash forms of renewal accounting described above (Simpkins and Jensen, 1995a).⁶ In recent years, newer forms of renewal accounting have been developed as an alternative to traditional depreciation accounting for infrastructural assets. They can be described as deferred maintenance approaches to renewal accounting.

Deferred maintenance approaches to renewal accounting attempt to recognise decreases in the condition of the asset (Pallot, 1994; Audit Office, 1994). They attempt to recognise any increases or decreases in the overall service potential of the network and view maintenance and restoration expenditure which maintains the service capacity of the network as a surrogate for depreciation. For the remainder of this thesis, the term "renewal accounting" will refer to the deferred maintenance approach, as distinct from the cash approaches discussed above.

⁶ See Chapter 6, p. 102, for further discussion of the difference between cash approaches to renewal accounting and more recent forms of renewal accounting promoted for infrastructural assets.

Arguably, the SOLGM (1994a) guidelines, outlined in Chapter 4, describe the best deferred maintenance approach to renewal accounting in New Zealand to date. They provide a useful description of the renewal accounting method and are consistent with many other approaches found in the literature. The guidelines were developed in consultation with a wide range of public sector representatives, and have been, “promoted as a viable accounting alternative to traditional depreciation to a significant proportion of reporting entities holding infrastructural assets” (Simpkins and Jensen, 1995a, p. 1). In addition, Taylor (1995, p. 14) indicates that the concepts expressed in these guidelines appear to have gained widespread support in New Zealand local government.

The main requirements of the deferred maintenance approach to renewal accounting, as developed or proposed by several authorities,⁷ are:

- that the infrastructural asset network is a single asset;
- that the network has an indefinite useful life;
- that renewal accounting applies only to network assets – non-network assets are depreciated;
- that no depreciation is charged;
- that a basis for distinguishing between revenue and capital expenditure is required;
- that provisions for deferred maintenance are made;
- that a steady state assumption is required and loss of service potential must be reported accurately; and
- that asset management plans are required.

Each of the above eight requirements are examined in the sections below.

3.1 Infrastructural Asset Network is a Single Asset

Renewal accounting is based on the assumption that the infrastructural network is a single asset, providing a service (Kearney and Davin, 1994; Ministry of Commerce, 1994a; CICA, 1989). The emphasis is on the network as a whole, rather than upon its individual components (Smith, 1995). Renewal accounting therefore recognises that the network, as a whole, is intended to be maintained at a specified level of service potential by the

⁷ These requirements have been identified and taken from the SOLGM (1994a) guidelines (see Chapter 4), the Ministry of Commerce (1994a) guidelines (see Chapter 4), the OFWAT (1993a) and Price Waterhouse (1989) guidelines for renewal accounting in the UK water industry (see Chapter 3), the renewal accounting approach described by the CICA (1989) Study Group (see Chapter 3), and also from Currie (1987).

continual replacement and refurbishment of its components (Kearney and Davin, 1994; SOLGM, 1994a; Ministry of Commerce, 1994b; Price Waterhouse, 1989).

Currie (1987, p. 8) argues that renewal accounting is a way of providing information about the maintenance of infrastructural assets, since this is what managers are accountable for:

Management's primary accountability in relation to such assets is to maintain them in good and consistent condition so as to provide the services required. The accountability is not to maintain any specific asset, but to maintain the operating capability of the system. We therefore require information for management which responds to this accountability.

Therefore, renewal accounting is based on the requirement to continually maintain the network (as a whole) and for transparent assessment of the annual expenditure on maintenance needed for this purpose (Lewis, 1992).

3.2 Indefinite Useful life

Provided they are continually maintained, infrastructural assets will last indefinitely. Hence, under renewal accounting, the network as a whole has an indefinite useful life, even though individual components have finite useful lives (SOLGM, 1994a; Ministry of Commerce, 1994a; Pallot, 1994).

Under traditional depreciation accounting, fixed assets are considered to have finite useful lives. In effect, renewal accounting assumes that infrastructural assets do not have finite useful lives and, therefore, do not meet the definition of depreciable assets in SSAP 3 (NZSA, 1984) (Hay, 1994).⁸ The SOLGM (1994a, p. 1) guidelines interpret depreciation, "as being zero due to Infrastructural Assets[,] as defined, being maintained in perpetuity". The guidelines propose that infrastructural assets are networks, which have indefinite useful lives, and recommend that SSAP 3 should be interpreted in this way. In addition, Pallot (1994, p. 14) states, "renewal accounting has been interpreted by New Zealand auditors as consistent with SSAP 3 if the useful life of infrastructural assets is accepted as indefinite". Furthermore, she suggests that there need not be any conflict with GAAP, and that, "the only modification required to the existing SSAP 3 is recognising that not all assets have a determinable useful life" (p. 20).

⁸ See Footnote 14, p. 60.

The assumption of an indefinite useful life under renewal accounting is appropriate only if there is a clear intention to maintain the service capacity of the infrastructure asset into the indefinite future (CICA, 1989). The SOLGM guidelines (1994a, p. 5) state that an asset can have an indefinite useful life when all of the following conditions are met:⁹

- The council has formally recorded a decision to maintain the network in a defined and appropriate operating capacity by a program of restoration to ensure that its useful life will be indefinitely prolonged.
- An appropriate Asset Management Plan has been adopted by the Council. This plan needs to provide reliable information on:
 - the current physical extent, condition and capacity of the network; and
 - the timing, extent and cost of work required to maintain and restore the network's defined operating capacity in future years.

Hence, a commitment to maintaining the network indefinitely and the adoption of an AMP by the entity is required for the assumption of an indefinite useful life.

3.3 Applied Only to Network Assets - Non Network Assets Are Depreciated

Renewal accounting is applicable only to assets associated with the network which are intended to be maintained indefinitely at a particular level of service potential (SOLGM, 1994a; Ministry of Commerce, 1994a).¹⁰ Assets which are not considered to be part of the network are depreciated in the normal way (SOLGM, 1994a; Deloitte Touche Tohmatsu, 1995b; Ministry of Commerce, 1994a). These assets have finite useful lives and are not intended to be maintained indefinitely. Such assets may include associated assets which do not form part of the network. For example, non-network assets associated with a sewerage system might include: mobile pumps and generators, depots and offices, stores, spare parts, vehicles, and computer hardware and software (SOLGM, 1994a).

3.4 No Depreciation is Charged

Under renewal accounting, no depreciation is charged (SOLGM, 1994a; Ministry of Commerce, 1994a; OFWAT, 1993a; Price Waterhouse, 1989; CICA, 1989). There is an implicit assumption that there is no reason why the network's overall service potential

⁹ Note: The GASB (1995) considers capital assets to be 'indefinite-lived' capital assets under very much the same criteria (see Chapter 3, p. 39).

¹⁰ The SOLGM (1994a, p. 4) guidelines indicate that, for a sewerage system, the following assets would be part of the network and would be suitable for renewal accounting treatment: pipes; service leads; manholes; pipe support structures; tunnels; air valves, vents and storage chambers; cleaning eyes; telemetering hardware and software; pump chambers; electric motors; pumps - large and small; pump station pipework and valves; pump station switchgear and transformers; pump station generator; pump station building and structures; treatment plant; and land.

should decline, because expenditure on maintenance and replacement restores any losses in service potential (Deloitte Touche Tohmatsu, 1995c; SOLGM, 1994a). This expenditure is viewed as a surrogate for depreciation and a measure of the loss or consumption of service potential in the overall network (SOLGM, 1994a; Pallot, 1994). Therefore, no depreciation is charged because the full cost of maintaining the operating capability of the network is expensed.

3.5 Basis for Distinguishing Revenue and Capital Expenditure Needed

Renewal accounting treats expenditure which restores and sustains the capacity of the infrastructural asset network as an expense (SOLGM, 1994a; Ministry of Commerce, 1994a; OFWAT, 1993a; Price Waterhouse, 1989). Expenditure which increases the overall service capacity of the network is capitalised (SOLGM, 1994a; Ministry of Commerce, 1994a). It is therefore important to clearly distinguish between revenue and capital expenditure (Smith, 1995; SOLGM, 1994a; Smithies, 1993; Rowles, 1992; Currie, 1987).

A host of different terms to describe maintenance are found in the professional and academic literature; for example, 'replacement and refurbishment expenditure', 'renewal expenditure', and 'maintenance, renewal, and reconstruction expenditure'. Smith (1995) advocates the need for common ground on the various types of maintenance categories so that it is known exactly what is meant.¹¹

3.5.1 Operational Definitions of Revenue vs Capital Expenditure

Operational definitions which enable a clear distinction between revenue and capital expenditure are needed under renewal accounting. The following examples of definitions from the literature provide varying degrees of detail.

The SOLGM (1994a, para 1.4) guidelines state that particular emphasis must be given to distinguishing the following when accounting for assets included within the network:

¹¹ In addition to the above terms, Smith (1995, p. 7) identifies the following maintenance categories: routine, preventative, reactive, emergency, rehabilitative, renewals, restorative, cyclic, repairs, servicing, and inspection maintenance categories. Smith (1995) suggests that precise definitions are needed which identify clearly what is and what is clearly not maintenance, and that the various types of maintenance should be spelt out in the AMP. Furthermore, the financial recording system should mirror the AMP for maintenance categories (Smith, 1995, p. 7).

- Work which adds to the capacity of the network and should be capitalised as an addition.
- Work which restores and sustains the capacity of the network and is renewal expenditure. The accounting treatment will depend on the accounting policies adopted.
- Work which is maintenance and repairs should be expensed.

The above categories are described in broad terms and enable an operational distinction to be made between the various types of expenditure on infrastructural assets. Expenditure which restores and sustains the capacity of the network is expensed under renewal accounting, whereas, under traditional depreciation accounting it is capitalised.

The REVENGE classification is used in the UK water industry. The REV category of expenditure relates to work needed to maintain or restore the performance and structural condition of water assets and systems (Price Waterhouse, 1989, para 3.3).¹² REV expenditure is made up of the LRNC and Initial Backlog expenditure (which is capitalised). Capital expenditure (ENGE) is made up of Enhancement, New, Growth, and Efficiency categories of expenditure.¹³ Revenue and capital expenditure are also described in broad terms in the Price Waterhouse (1989) guidelines as follows:

- expenditure on infrastructure assets relating to improvements to the networks through enhancements or extensions is treated as additions [i.e. capital expenditure]. . . , and
- expenditure on maintaining the operating capability of the network in accordance with defined standards of service set out in the AMP is charged as an operating cost [i.e. revenue expenditure] (para 2.9).

The Ministry of Commerce guidelines (1994a, p. 8) provide more detailed definitions of expenditures, which maintain service potential and those which enhance the service potential of electricity networks, as a whole, as follows:

Expenditure which maintains the service potential:

- Repairs.
- Replacements where components are replaced by identical or modern equivalent components which perform materially the same function. As a result of technological improvement they may be technologically quite different or may have a degree of enhanced performance. Judgement is required as to whether this provides a material increase in the asset's service potential, with regard to its main attribute, e.g. capacity.
- Refurbishments, where components are internally renewed through cleaning, replacement of worn with new parts, painting etc.

¹² The Price Waterhouse (1989, p. 14) guidelines provide a number of examples of revenue expenditure, including: replacement of a main or sewer, which is in poor condition, to its original capacity; replacement of a burst main; repairs - minor or major; size for size replacement of lengths of water main or sewer; other health and safety measures; scraping and relining; refurbishing; replacement of step irons or manhole covers; general pipe bursting (size for size); general leakage control; general sewerage condition survey; and other studies so far as they are not related to specific schemes.

¹³ See Chapter 3, p. 41, for a brief description of these terms.

Expenditure which enhances service potential

- All extensions to the system (e.g. resulting from new customers, new subdivisions).
- Material increases to the capacity of existing components (eg. lines, transformers).
- Material increases in the reliability of the existing system.
- Any new components where none previously existed.
- Material additions or improvements to the performance of existing components which improve the service potential and performance of their primary function.

Although the above guidelines are not a comprehensive listing, they serve to show the principle categories and principles involved in distinguishing between different types of expenditures (Ministry of Commerce, 1994a).

The North Shore City Council defines three categories of expenditure, including: routine maintenance, major maintenance (which are expensed), and capital expenditure (Lewis, 1992).¹⁴ The essential features of these categories of expenditure are found in the SOLGM's (1994a) categories described above.

From the above discussion it appears that, under renewal accounting, revenue expenditure maintains the service capacity or potential of the network and is expensed, whereas, capital expenditure increases the overall service capacity of the network. Any renewal accounting policy should include operational definitions, such as those noted above, to enable a clear distinction to be made between revenue and capital expenditure. The SOLGM (1994a) categories above suffice for this purpose and appear to be reasonably consistent with the other definitions mentioned. Once definitions have been developed and adopted, they should be applied consistently (Ministry of Commerce, 1994a).

3.5.2 Proportional Allocation Between Revenue and Capital Expenditure

Problems arise in the application of renewal accounting where expenditure both maintains and increases the service capacity of the asset. Examples include: (1) replacing a sewerage pipe which also provides for increased capacity of sewerage flow because the diameter of the replacement pipe is larger than the one being replaced; (2) road widening in conjunction with shape correction works; and (3) a reservoir or treatment plant which is replaced by a new reservoir or treatment plant with greater capacity (SOLGM, 1994a).

¹⁴ Detailed descriptions of these categories of expenditure are shown in Appendix 4.

In such instances, the SOLGM (1994a), Ministry of Commerce (1994a) and Price Waterhouse (1989) guidelines¹⁵ all propose an allocation between the portion of expenditure relating to renewals to expense, and that relating to the increased capacity to capital expenditure.¹⁶ The following projects may have elements of both renewal and capital expenditure (SOLGM, 1994a, pp. 2-3):

- interceptor sewers
- water main duplications
- reservoir replacements
- pump station up grading
- stopbank replacement
- roading reconstruction and widening
- bridge widening

The SOLGM (1994a) guidelines state that professional judgement will need to be exercised in establishing proportions between renewals and capital and should be allocated on the basis of proportional design flows or capacity.¹⁷

3.6 Provisions for Deferred Maintenance are Made Where Necessary

Deferred maintenance forms of renewal accounting recognise any shortfalls in the expenditure needed to maintain the network. Any shortfall in restoration work is recognised as an expense, and a 'provision for deferred maintenance' or 'provision for renewals' is deducted from the gross value of the asset in the balance sheet (SOLGM, 1994a; Pallot, 1994; Ministry of Commerce, 1994a; CICA, 1989). The provision for

¹⁵ Note: the SOLGM (1994a) guidelines, when being drafted, consulted the Price Waterhouse guidelines (1989) (see Chapter 3, p. 40), (Taylor, 1995), and therefore contain similar principles to those found in the UK guidelines.

¹⁶ The SOLGM (1994a, p. 2) guidelines provide the following example of proportional allocation between renewal and capital expenditure: "If a 150mm diameter pipe that has an existing peak flow of 18 litres/sec, is replaced by a 225 mm pipe with a design peak flow of 54 litres/sec then it may be appropriate to apportion costs 33% to renewals and 67% to capital". In addition, they state that a more precise apportionment between renewals and capital will be required if the marginal cost involved in increasing the capacity over and above the existing capacity is not directly proportionate to the percentage increase in capacity, and the difference between the marginal cost and prorated cost is likely to be material (SOLGM, 1994a, p. 2).

¹⁷ Smith (1995, p. 6) states that, from an audit perspective, for expenditure in the grey area between capital and maintenance, they (Audit New Zealand) would be looking to establish:

- Council's intention.
Was the project earmarked in the asset management plan? Was it intended that a new pump, which has a greater potential capacity, merely replace the existing one, or is it intended to cope with an increased capacity?
- Reasonableness
Does the resultant capital/maintenance split appear reasonable having regard to the significance of the amount and type of project?
- Council's process in reaching a decision.
We would look to see how Council went about making their decision, e.g.
 - agreement between asset managers/financial people
 - analysis of physical and financial data that supports maintenance/capital split
 - application of internal accounting rules.

This last point could include apportionment of costs on either a marginal or proportionate basis (i.e. proportional allocation).

- Documentary evidence
Ensuring that all information regarding the apportionment is kept for later reference and for audit.

deferred maintenance is considered to be a surrogate for depreciation (SOLGM, 1994a; Pallot, 1994). As long as the maintenance required is actually performed, then the deferred maintenance is zero (Deloitte Touche Tohmatsu, 1995c; Pallot, 1994; Audit Office, 1994a). Expenditure which makes up any deferred maintenance brought forward is deducted from the amount of maintenance previously deferred and allowed for and not further expensed (Smith, 1995; SOLGM, 1994a).

The CICA (1989, p. 62) Study Group suggests:

Unlike provisions for asset replacement now found in the financial statements of some municipalities, the provision for renewals would not be a discretionary means of setting aside surplus funds. The actual funding of a provision for renewals would be a decision distinct from recording the provision.

The budgeted amount of annual maintenance required would be clearly stated in the AMP and separate from decisions about how much expenditure to undertake.

3.6.1 Complications with Provisions for Deferred Maintenance

Smith (1995) points out that there are potential complications where maintenance is performed in advance, that is, where more maintenance is performed than what is required by the maintenance schedule (in the AMP). He argues against treating such expenditure as the opposite of deferred maintenance and adding it to the asset's value in the balance sheet. Instead, the rationale for maintenance is to preserve service potential (Smith, 1995). Therefore, asset values should not be inflated and expenditures on maintenance in advance should be treated as prepayments (Smith, 1995). This is similar to the approach adopted in the UK water industry, where expenditure above or below the Long Range Normative Charge is recognised either as an accrual or a prepayment (OFWAT, 1993a; see Chapter 3, p. 41).

Under renewal accounting, it is necessary to recognise any changes in the overall service potential of the network. Under- or over-maintenance, in theory, represents a loss or gain in service potential, and hence the asset value should be written up or down accordingly (Ministry of Commerce, 1994a). Table 5.1 below illustrates circumstances which could

arise and have a bearing on levels of service potential, and in which the value of the asset should or should not be adjusted.¹⁸

Table 5.1: Adjustment of Asset Value for Changes in Service Potential¹⁹

No Change in Value	Adjust Value
<ul style="list-style-type: none"> • Lower or higher efficiency in the way maintenance is carried out but with the service potential as set out in the AMP being met. 	<ul style="list-style-type: none"> • Maintenance expenditure exceeds/ is less than planned expenditure and results in an increase/decrease in service potential. • Policy to increase/reduce service potential can result in an increase/reduction in value (e.g. because the capacity or condition of the system is less than or greater than that required in the long term).

The Ministry of Commerce guidelines (1994a, p. 10) state that the following principles should be applied to address the issues in Table 5.1 above:

- Asset infrastructure write-ups or write-downs should be based on changes in the assessed physical service potential of the system, not on financial deviations between planned and actual expenditure.
- Where the service potential is reduced, then the amount of infrastructure asset write-down should be calculated as the asset value multiplied by the proportion by which the service potential is assessed as having been reduced. In the extreme, therefore, if no life extending maintenance was carried out on the infrastructure asset over a year, the asset write down would be determined by the infrastructure asset value divided by the remaining life, that is, straight-line depreciation.
- Similarly, where the service potential is increased, by say, undertaking “backlog maintenance” [that is, catch up of past deferred maintenance], then the asset value should be written up by the pro-rata proportion by which the service potential has been increased.

It is also important to make sure expenditure which reduces the deferred maintenance provision is directly related to previous deferrals. Therefore, correctly identifying expenditure is important (Smith, 1995). Smith (1995) also contends that, where deferred

¹⁸ Source: Deloitte Touche Tohmatsu, (1995c) “Renewal Accounting”, paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March, p. 3 (Note: Table 5.1 is a summary of circumstances originally outlined in the Ministry of Commerce (1994a) guidelines, p. 9).

¹⁹ Note: Table 5.1 does not mention one other circumstance, which the Ministry of Commerce (1994a, p. 9) guidelines provide, as follows:

Where there has been significant recent growth in the system a material proportion of the infrastructure asset may be relatively new and thus not yet being renewed. Where a material reduction in service potential of the whole infrastructure asset has taken place, this should be recognised as depreciation and the asset value reduced accordingly.

Discussion of the accounting treatment, under renewal accounting, for new infrastructure systems or systems with significant new portions follows in a later section on the ‘renewals holiday’ (see p. 95).

maintenance is increasing over a long-time frame, it will be necessary to reassess the up-to-date cost of all the shortfall work (Smith, 1995).

3.7 A Steady State is Assumed and Reporting Loss of Service Potential Accurately

Renewal accounting should provide a good measure of the loss of service potential or the current resources consumed in providing the services of infrastructural assets where the asset network is in a “steady state” (Deloitte Touche Tohmatsu, 1995c; Ministry of Commerce, 1994a; OFWAT, 1993a; CICA, 1989; Currie, 1987).

A system in a steady state refers to a network system which has ceased growing and is being maintained at a given size (Rowles, 1992). Alternatively, OFWAT (1993a, p. 4) defines steady state as:

... where a body of assets remains in indefinite equilibrium because its component parts are wearing out and being replaced at a constant rate such that the operational effectiveness and hence value of that body of assets remains a constant in real terms.

Therefore, steady state refers to a network or system which is relatively mature and being maintained by the continual replacement and renewal of component parts so that the overall service potential of the system remains constant.

It is unlikely that infrastructural asset systems will remain in a steady state forever. Rowles (1992) argues that, where the population serviced is growing, it is likely that network systems, in the long run, will be expanded. Adjustments to reflect changes the system's service potential will be required with a significantly growing or shrinking system, therefore, complicating the renewal accounting approach (Ministry of Commerce, 1994a).

Problems with the assumption of a steady state arise where: (1) large components of the network are replaced and expensed, thus causing a ‘lumpiness’ in expenditure patterns, and/or (2) an infrastructural asset system is new or comprises a significant portion of new components, in which case there is a ‘renewals holiday’.

3.7.1 Lumpiness in Expenditure Patterns on Infrastructural Assets

Large components of a network being replaced will cause lumpy expenditure patterns if the full cost of these are expensed all at once. Simpkins and Jensen (1995a, p. 12) state:

In the replacement year, the full cost of replacement is reported and the cost of service for that year is inflated. In other years, the reduction in service potential each year as the asset's finite life is used up is not reported. . . . Large fluctuations in costs resulting from replacing major components have the potential to significantly reduce the value of statements of cost of significant activities for evaluating management performance. Those who criticise renewal accounting for its similarity to cash accounting generally point to these disadvantages.

Smith (1995) indicates that the question of whether the maintenance provision should be smoothed (either by a straight average or stepped increase), arises in these situations. The SOLGM (1994a) guidelines indicate that major fluctuations may occur in restoration expenditure from year to year and that it may be necessary to make adjustments to the renewals policy to provide a smoothing effect. The guidelines state that it may be necessary to adopt an annualized charge to certain major components of the network (para. 3.2). In this case, the yearly "smoothed" maintenance provision would be larger than the scheduled maintenance required (Smith, 1995). The Long Range Normative Charge, used in the UK water industry, is an example of smoothing lumpy expenditure patterns.

Where fluctuations are extreme, it may be more appropriate to separate major components of an infrastructural network and account for them separately (Pallot, 1994). Similarly, Simpkins and Jensen (1995a) propose a modification and extension of the SOLGM (1994a) guidelines renewal approach called "modified renewal accounting" to deal with the 'lumpiness' problem.

Modified renewal accounting would be the same as the SOLGM (1994a) approach, except that major sub-components of the network would be accounted for separately. Under modified renewal accounting, it is accepted that the network as a whole is viewed as the asset. However, it is also argued that accurate reporting of loss of service potential requires the identification of major sub-components of the network (Simpkins and Jensen, 1995a). Simpkins and Jensen (1995a, p. 13) state:

Modified renewal accounting would *require* Councils to allocate the cost of definable major components with finite lives which form part of a network over their useful life. Expenditure on replacing such components would be capitalised and added to the value of the network and then allocated over the component's lifetime. Expenditure on

replacement of a major component would not be reported as a maintenance expense in the year of replacement.

Modified renewal accounting would alleviate the problem of the effect of lumpy expenditure patterns on reported costs when major sub-components of the network are replaced. The approach would result in a more stable annual expense because large components would be capitalised and their cost allocated over their lifetimes instead of being treated as maintenance and expensed all in one year (Simpkins and Jensen, 1995a).²⁰

3.7.2 Renewals Holiday

When a new infrastructure system has been created, renewal accounting is likely to underestimate the loss of service potential (Simpkins and Jensen, 1995a). During this period, it is very unlikely for a great need for renewal and replacement in the system, and in fact, this may virtually be nil (Simpkins and Jensen, 1995a; Currie, 1987). Currie (1987) refers to this period as the 'renewals holiday'. This lasts until the new system reaches its steady state, at which point renewal and replacements are needed to maintain the system at operating capacity. Currie (1987, p. 8) states:

It is only when the systems are in a mature state, or what has become known as the 'steady state' that the costs of renewals are likely to be equivalent to the costs of consumption. After all, when a brand new system is built to provide new service there will be no need for renewals for a number of years, and then the incidence of renewals will gradually climb to a steady level at which point the system may be in equilibrium.

Consumption of service potential is obviously taking place during such a period, otherwise the subsequent need for renewals would never arise (Currie, 1987). Currie (1987) suggests charging a provision against the elements that will need renewing in the future. The process ceases once the infrastructure system reaches its steady state. Therefore, the net current cost of the asset system will comprise:

... the full current cost of non-renewable elements with an indefinite foreseeable life, plus the current cost of renewable elements abated to their steady state level, which might normally reflect the expectation that they are on average at mid point in their renewal cycle (ie at half current costs) (Currie, 1987, p. 9).

²⁰ Simpkins and Jensen (1995a) evaluated and performed an analysis of the SOLGM (1994a) renewal approach (without the option of smoothing expenditures) and the modified renewal approach by applying financial scenarios to each. They found that the SOLGM approach has the potential for large variations in reported expenses where major sub-components are replaced and expensed all at once, thus creating 'lumpiness' in maintenance expenditure. Modified renewal accounting, on the other hand, provided a smoother pattern of charges to reflect the consumption of service potential. Therefore, the modified renewal approach appears to result in a more accurate and meaningful measurement of the cost of services than the SOLGM approach where major sub-components are replaced (Simpkins and Jensen, 1995a).

Currie notes that the process of charging a provision for renewals against profit during the renewals holiday is similar to depreciation.²¹ However, he argues that the focus is on the renewable elements of the system and that the need is to reduce the original value of the asset, not by estimating the whole life of the system, but by estimating what processes of renewal will be necessary to the system and when they will take place. This will help avoid depreciating elements of the system which in fact have an indefinite life, provided the renewable elements are renewed (Currie, 1987).²²

A depreciation charge in the early life of the system, while it is maturing to a steady state, has also been suggested by the CICA (1989) Study Group, and, similarly, by the Ministry of Commerce (1994b, p. 16):

Under these circumstances, if a material reduction in service potential is occurring, then this should be recognised via a depreciation charge and a reduction in asset value. At the time when these new assets become part of the regular refurbishment and replacement cycle of the whole system, the lowering of service potential will be recognised through expensing the maintenance expenditure and not via a depreciation charge.

Alternatively, entities may simply choose to use traditional depreciation accounting to deal with the renewals holiday. Simpkins and Jensen (1995a) indicate that the Office of the Controller and Auditor-General (Audit Office) would expect that with new networks, or networks with significant new portions, traditional depreciation accounting would be more appropriate.²³

3.8 Asset Management Plans are Required

Asset management plans are an essential prerequisite for the use of renewal accounting (Audit Office, 1994a). Pallot (1995, p. 14) illustrates this by arguing that AMPs are needed:

²¹ An illustration of how Currie (1987) suggests the renewable elements of water and sewerage infrastructural assets might be accounted for, during the renewals holiday and the first cycle of renewals, is shown in Appendix 5.

²² Note: The renewals holiday accounting treatment proposed by Currie (1987) was also suggested for a drainage system in the NZSA's (1990, p. 5) Technical Guidance Bulletin (ED/TGB-4): "Defining and Reporting Community Assets".

²³ Additionally, Simpkins and Jensen (1995a, pp. 25-26) outline key characteristics which the Office of the Controller and Auditor-General expects of an acceptable form of renewal accounting. Many of the points raised in this chapter are consistent with these characteristics, which include: comprehensive AMPs are needed which make it possible to know whether the current level of service potential is being maintained, reduced or enhanced (as discussed in the next section); that there is a clear policy of what is maintenance and what is capital expenditure; that renewal accounting policies are applied consistently from year to year; that any material enhancements or reductions in the system's service potential are reported; and that major sub-components of the network with determinable finite useful lives are to be accounted for separately by traditional depreciation (see Appendix 6 for further details).

... to support claims that the service potential has been restored. Without such a plan, any deferred maintenance recognised each accounting period cannot be objective, reliable or relevant. With such a plan, the measurement of expense is arguably not only more relevant but also more reliable based on debatable asset valuations and indeterminate life.

The Ministry of Commerce (1994a) guidelines also indicate that it is likely that a certified AMP will be necessary to demonstrate that no change in service potential has occurred (or enable an assessment of the change in the level of service potential) for electric power companies using renewal accounting. Furthermore, as indicated earlier, AMPs are one of the criteria necessary for assuming an indefinite useful life for infrastructural assets (see SOLGM (1994a) and GASB (1995)).²⁴

4. Chapter Summary

The two main approaches to renewal accounting are the cash approach and the deferred maintenance approach. Cash forms of renewal accounting were widely used by nineteenth century railway companies, particularly in the form of replacement accounting. However, they are inconsistent with the Statement of Concepts (NZSA, 1993) and inappropriate for financial reporting and measuring the loss of service potential for infrastructural assets.

In recent years, deferred maintenance approaches to renewal accounting have been promoted, both in New Zealand and overseas, as an alternative to traditional depreciation accounting for infrastructural assets. The SOLGM (1994a) working party's deferred maintenance renewal accounting method is, arguably, the best example available in New Zealand to date.

Eight main requirements of the renewal accounting method were identified:

- (1) the infrastructural network is treated as a single asset;
- (2) the network, as a whole, has an indefinite useful life;

²⁴ It must be noted that for New Zealand local authorities:

Most councils do not yet have comprehensive AMPs in place, as they are still identifying their assets, and developing knowledge of their condition. There is a "limbo" period for many Council [sic] where, although infrastructural accounting [renewal accounting] has been adopted, AMPs don't exist to provide the rationale for asset maintenance (Smith, 1995, p. 4).

Despite this limitation, the SOLGM guidelines (1994a, p. 1) state, "during this transitional period, engineers estimates are considered to be a better assessment for recording loss of service potential than a fixed charge for Depreciation [sic]".

- (3) renewal accounting is applied to assets which are part of an infrastructural network, whereas non-network assets are depreciated in the normal way;
- (4) renewal and replacement expenditure restores and sustains the service potential of the network and is considered to be a surrogate for depreciation and a measure of the loss of service potential. This is expensed and classed as revenue expenditure. Capital expenditure, on the other hand, extends or increases the overall service capacity of the network;
- (5) no depreciation is charged, provided the overall service potential of the network is maintained;
- (6) where maintenance is deferred for some reason, a provision is deducted from the gross value of the asset in the balance sheet;
- (7) renewal expenditure should equal loss of service potential where systems are in a 'steady state'. Lumpy expenditure patterns might be smoothed over a period of time or, alternatively, accounted for separately. Simpkins and Jensen (1995a) recommend a 'modified renewal accounting' method which requires major sub-components to be capitalised and written off over their finite useful lives. For new asset systems, or those significantly made up of new portions, a provision for renewals might be charged against the asset until it enters its cycle of renewal and replacement. Alternatively, traditional depreciation may be more appropriate; and
- (8) asset management plans are required to operate a renewal accounting policy for infrastructural assets.

Chapter 6

RENEWAL ACCOUNTING AND TRADITIONAL DEPRECIATION

1. INTRODUCTION.....	100
2. RENEWAL ACCOUNTING CONTRASTED WITH TRADITIONAL DEPRECIATION	100
3. CONSIDERATIONS RELEVANT TO USING RENEWAL ACCOUNTING.....	101
3.1 <i>Measuring and Reporting Losses of Service Potential</i>	102
3.1.1 Renewal and Replacement Expenditure May Not Equal Loss of Service Potential.....	102
3.1.2 Accounting for Expenditures Which Increase Service Potential.....	103
3.1.3 Avoidance of Double Counting.....	104
3.1.4 Arbitrariness of Depreciation Rates.....	104
3.1.5 Subjectivity of Judgments Under Renewal Accounting.....	104
3.1.6 Renewal Accounting and Traditional Depreciation –Similar Reported Expenses.....	105
3.2 <i>Effect on Balance Sheet Values</i>	106
3.3 <i>Conceptual Rigour of Requirements of Renewal Accounting</i>	107
3.3.1 Indefinite Useful Life.....	107
3.3.2 Provisions for Deferred Maintenance.....	107
3.4 <i>Scope for Manipulation</i>	108
3.5 <i>Simplicity and Complexity</i>	109
3.6 <i>Supports Good Management Practice</i>	109
3.6.1 Aligned to Management Information Needs.....	110
3.6.2 Focuses on Maintenance Requirements and Ensures Proper Funding.....	110
3.6.3 Encourages a Multi-disciplined and Integrated Management Approach.....	111
3.7 <i>Recognition of Public Nature of Government</i>	111
4. CHAPTER SUMMARY	111

1. Introduction

The renewal accounting method, particularly the deferred maintenance approach, was examined in Chapter 5. This chapter first examines the differences between renewal accounting and traditional depreciation accounting. Secondly, considerations which are relevant to using renewal accounting for infrastructural assets are discussed.

2. Renewal Accounting Contrasted with Traditional Depreciation

Table 6.1 below displays the basic differences between renewal accounting and traditional depreciation accounting.¹

Table 6.1: Renewal Accounting vs Traditional Depreciation²

Renewal Accounting	Traditional Depreciation
<p><i>Based on the assumption that the infrastructural network is a single asset, providing a service, which will be maintained in perpetuity (Kearney and Davin, 1994; Ministry of Commerce, 1994a; CICA, 1989).</i></p> <ul style="list-style-type: none"> • Applied only to assets that are part of the infrastructural network or system (SOLGM, 1994a; Ministry of Commerce, 1994a). • The network is viewed as a single asset which, as a whole, has an indefinite useful life even though individual components have finite useful lives (Kearney and Davin, 1994; SOLGM, 1994a; Ministry of Commerce, 1994a). • Operating and maintenance costs are expensed. • Renewal and replacement expenditure, which maintains the overall service potential (capacity) of the system, is expensed. • Expenditure which increases the overall service potential (capacity) of the network is capitalised. • The network's value in the balance sheet is written down only when maintenance is deferred or a material loss of service potential occurs (SOLGM, 1994a; Ministry of Commerce, 1994a; CICA, 1989). 	<p><i>Involves accounting for infrastructural assets on the same basis as that normally applied to fixed assets.</i></p> <ul style="list-style-type: none"> • Applied to individual infrastructure fixed assets. • Infrastructure viewed as an asset with components which can be accounted for separately and which have finite or limited useful lives. • Operating and maintenance costs are expensed. • Expenditure which increases or enhances the service potential of component assets is capitalised. • The capitalised cost or value of each component is allocated (depreciated) over its estimated useful life—depreciation is a process of cost allocation (Anthony, 1994; Hornigen et al, 1992; Nikolai and Bazley, 1988).

¹ Traditional depreciation accounting refers to the accounting treatment normally applied to fixed assets, where depreciation is the allocation of an asset's cost over the period of its estimated useful life. The term "traditional depreciation" is used to denote this accounting approach for the remainder of the thesis.

² Note: Table 6.1 is substantially based on Kearney and Davin's (1994, pp. 5-6) description of the differences between the two approaches.

Three major differences between renewal accounting and traditional depreciation are discernible from Table 6.1 above. First, renewal accounting emphasises accounting for the network as a whole (Smith, 1995). The network is viewed as a single asset which has an indefinite useful life. Conversely, traditional depreciation emphasises accounting for individual assets within the network (Smith, 1995) and, consequently, their finite useful lives.

Second, under renewal accounting, expenditures on renewal and replacement are expensed, whereas under traditional depreciation they are capitalised.

Third, renewal accounting expenses the cost of maintenance as a measure of the loss of service potential. Taylor (1995, p. 11) states, “the financial measure of ‘depreciation’ is based on the physical reduction or consumption in service potential rather than on the amortisation of historic cost or value”. In contrast, traditional depreciation is a process of cost allocation. The gross value of the infrastructural asset is written down each period by allocating the cost or value of its individual components over their estimated useful lives. Therefore, the asset’s value in the balance sheet is continually written off under traditional depreciation (by the allocation of cost or value), whereas under renewal accounting it is reduced only where maintenance is deferred or a material loss of service potential occurs.

3. Considerations Relevant to Using Renewal Accounting

There are a number of arguments in the literature for and against the use of renewal accounting, often in contrast to traditional depreciation. They are examined below under the following headings:

- measuring and reporting losses of service potential;
- effect on balance sheet values;
- conceptual rigour of requirements of renewal accounting;
- scope for manipulation;
- simplicity and complexity;
- supporting good management practice; and
- recognition of public nature of government.

3.1 Measuring and Reporting Losses of Service Potential

Several issues concerning the measurement and reporting of losses of service potential on infrastructural assets are discussed below under the following topics:

- renewal and replacement expenditure may not equal loss of service potential;
- accounting for expenditures which increase service potential;
- the avoidance of double counting;
- the arbitrariness of depreciation rates;
- the subjectivity of judgements made under renewal accounting; and
- the possibility that both renewal accounting and traditional depreciation may produce similar reported expenses.

3.1.1 Renewal and Replacement Expenditure May Not Equal Loss of Service Potential

Renewal accounting may not accurately report loss of loss service potential because (1) the cash approach to renewal accounting is used, or (2) where there is major “lumpiness” in expenditure patterns on infrastructural assets.

Firstly, Rowles (1992, p. 59) states:

... renewal accounting is a form of cash accounting. Only when expenditures made in one accounting period on maintaining an asset system coincide with the cost of consumption of asset service potential will period expenses and asset stocks not be misstated. It is unlikely that such chance circumstances will pertain over the long life span of infrastructure type assets, on a period-by-period basis and, in periods in which expenditures on the acquisition of service potential are made, period expenses will be overstated, and asset stocks understated.

However, Simpkins and Jensen (1995a, p. 8) point out that it is important to appreciate that Rowles (1992) was criticising a form of renewal accounting which reported *any* cash expenditure on infrastructure during a period as an expense; “this expense replaced the reporting of loss of service potential and was not assessed in terms of its effect of either increasing or maintaining the service potential of the asset”. Under this form of renewal accounting, even expenditure which increased the operating capacity of the network could be expensed (Simpkins and Jensen, 1995a), hence the criticism of being a “cash accounting” approach. Furthermore, an expense is not reported when required maintenance is not performed (Simpkins and Jensen, 1995a). On the other hand, the forms of renewal accounting being promoted in New Zealand today, such as the SOLGM (1994a) guidelines, are quite different from the cash forms of renewal accounting

criticised above (Simpkins and Jensen, 1995a). Under the deferred maintenance approach to renewal accounting (see Chapter 5), shortfalls in renewal and replacement expenditures are treated as expenses and are deducted from the gross value of the asset in the balance sheet, thereby recognising loss of service potential where maintenance is not performed.

Secondly, renewal expenditure will only be a good measure of the loss of service potential where there is no major “lumpiness” in the renewal cycle (CICA, 1989). Yet, expenditure on infrastructural assets often occurs in waves or echoes (Rowles, 1992; Paul, 1992). Therefore, the very long lives of infrastructure assets will create a timing disparity between the loss of service potential and the expenditure made on renewal, replacement and restoration of the assets from reporting period to reporting period (Rowles, 1992). Furthermore, the effect of lumpiness on reported expenses will hinder inter-entity and inter-period comparisons (Paul, 1992). However, the problem of lumpiness was discussed in Chapter 5 (pp. 94-95). Accordingly, some of the following alternatives might be applied to measure and report loss of service potential accurately: smoothing expenditures; separately accounting for large sub-components of the network (i.e. modified renewal accounting); and charging an expense to the operating statement during the renewals holiday.

3.1.2 Accounting for Expenditures Which Increase Service Potential

Rowles (1992, p. 60) argues that, to ensure accurate reporting of assets, expenditures which increase the stock of service potential must be distinguished from expenditures which are consumed during the period. Where expenditure provides future service potential, an asset is created and must be recognised (Rowles, 1992). Furthermore,

The necessity to repair, renew etc illustrates that pre-existing expenditures which provide service potential have been consumed, and must, therefore, be recognised as an expense. For example, the need to resurface a road indicates that the pre-existing surface has been consumed. . . . the cost of the original road surface should be depreciated over its useful life. Subsequent expenditures made to “renew” the surface should be accounted for as an asset because further service potential has been created (Rowles, 1992, p. 60).

Therefore, Rowles (1992) argues that traditional depreciation should be used to account for such expenditures. However, as mentioned previously, one of the essential differences between renewal accounting and traditional depreciation lies in the way each method measures losses of service potential.

Renewal accounting treats expenditures which maintain, renew and replace the network's service potential both as expenses and surrogates for depreciation (SOLGM, 1994a; Pallot, 1994). The treatment of expenditures which increase service potential merely serves to further illustrate one of the main differences between renewal accounting (which accounts for the network as a whole), and traditional depreciation (which accounts for individual assets within the network).

3.1.3 Avoidance of Double Counting

Renewal accounting is claimed to avoid the potential for "double counting" which may occur under traditional depreciation (Duncan, 1995; Davin, 1993; Lewis, 1992; Anderson, 1992). Under traditional depreciation, an organisation might be charging for depreciation as well as spending enough on maintenance to effectively extend the life indefinitely (Lewis, 1992), resulting in double counting (Duncan, 1995). In contrast, under renewal accounting, all expenditure which maintains the network's service potential is expensed, whereas expenditure which increases the networks' overall service potential is capitalised.³ Therefore, double counting should be avoided.

3.1.4 Arbitrariness of Depreciation Rates

Traditional depreciation is considered by some commentators to be arbitrary because it is:

... difficult to apply to networks as detailed records are needed to be maintained to capitalise, depreciate and ultimately write-off every replaced item. Economic lives of individual assets are very long, are variable, have different ages and are unpredictable (have high margins of error). Hence depreciation rates are difficult to determine with accuracy (Davin, 1993, p. 10).

In contrast, renewal accounting is claimed to overcome the arbitrary nature of depreciation rates (Duncan, 1995; Law, 1992; Lewis, 1992).

3.1.5 Subjectivity of Judgments Under Renewal Accounting

Renewal accounting also requires judgement and estimation (Simpkins and Jensen, 1995a; Hay, 1994; OFWAT, 1993a; GASB, 1987a). For example, it requires estimates of asset

³ The avoidance of double counting has been a particular concern in the electricity industry. This is illustrated by the Ministry of Commerce's Electricity Information Disclosure Regulations. The regulations require that depreciation and expenditure that has the effect of maintaining the service potential of assets are not both expensed for the same asset (Ministry of Commerce, 1994c, p. 6). Similarly, the Audit Office requires the renewal accounting policy to ensure that there is no double counting of expenditure (see Simpkins and Jensen, 1994a, and Appendix 6).

condition, operational capacity, whether systems are in a steady state (Simpkins and Jensen, 1995a), the level to which assets are to be maintained and the amount of maintenance required over a given period (Simpkins and Jensen, 1995a; Hay, 1994). Luder (1991, p. 19) asserts:

The amount of deferred renewal cannot be objectively ascertained but is dependent on the management's maintenance policy, on the procedure of monitoring and judging asset condition, on the management's judgement of the amount of maintenance expense that is necessary and sufficient not to impair the service capacity and other subjective judgements.

Nevertheless, Currie (1987, p. 10) argues:

The judgements that are required for renewals accounting (in defining steady state standards of service, monitoring asset condition, distinguishing between expenditure on growth and expenditure on renewals) are management judgements required in operational terms. Though they remain judgements, they are more likely to be reliable than judgements made only for accounting purposes (such as modern equivalent asset values, asset lives, etc).

Further, OFWAT (1993, p. 7) states:

While clearly . . . [the] process [of developing AMPs for renewal accounting] is subject to all the uncertainties of any process of estimation, it is a process that takes full account of current knowledge and experience and one with which engineers are familiar and in which they have some confidence.

Therefore, renewal accounting is claimed to provide information on infrastructural assets which is more reliable than traditional depreciation (Pallot, 1995; SOLGM, 1994a).

3.1.6 Renewal Accounting and Traditional Depreciation – Similar Reported Expenses

Despite claims that renewal accounting is a more reliable accounting method than traditional depreciation, if both are done properly then they may produce similar reported expenses in the financial statements (Simpkins and Jensen, 1995a; Ministry of Commerce, 1994b; OFWAT, 1993a.^{4,5} However, renewal accounting has the potential to provide more relevant information about how well infrastructural assets are being maintained. As

⁴ See Chapter 3, p. 42, for an illustration of how renewal accounting and traditional depreciation are simply two alternative ways of arriving at what in principle will be the same answer (OFWAT, 1993a).

⁵ Simpkins and Jensen (1995a, p. 15) contend that, where traditional depreciation is done well and the modified renewal accounting approach is adopted (see p. 94), both methods produce very similar amounts in the statements of financial position and financial performance. With regard to the application of traditional depreciation to infrastructural assets, they state:

Good information about asset lives properly applied means that users can place more reliance on reported depreciation expenses. Capitalising maintenance expenditure which restores service potential and applying depreciation rates which correctly reflect the remaining life of the asset may result in reported depreciation expenses which are as meaningful and accurate a reflection of loss of service potential as is generated by the modified renewal approach (Simpkins and Jensen, 1995a, p. 15).

Pallot (1995, p. 17) states, the SOLGM (1994a) proposed system of renewal accounting for infrastructural assets:

... produces direct measures of resource consumption which are both more relevant and more reliable than an allocation of contentious or confused valuations over economic lives that cannot be determined with any precision.

For example, renewal accounting provides relevant and useful information about the performance of management, deferred maintenance and the extent to which infrastructural assets are being maintained (Simpkins and Jensen, 1995a; OFWAT, 1993a). Thus, meeting users' needs of governmental financial reports for information on infrastructural assets.⁶ Under traditional depreciation, this type of information (on maintenance and deferred maintenance) is not reported in the financial statements (Simpkins and Jensen, 1995a).

Renewal accounting also provides relevant information about the extent to which intergenerational equity is maintained. By recognising shortfalls in restoration expenditure on infrastructural assets via the provision for deferred maintenance, this shows the extent to which maintenance required on infrastructural assets is being put off to future periods, therefore, allowing users of financial reports to identify the extent to which intergenerational equity is maintained (Patten and Wambsganss, 1991).

3.2 Effect on Balance Sheet Values

A perceived disadvantage of renewal accounting is that expensing refurbishments, which extend an asset's life, will leave only the asset's historic cost in the balance sheet (Duncan, 1995; Law, 1992; Lewis, 1992). However, this scenario is the same under traditional depreciation. Under either method, it is possible to revalue assets (Duncan, 1995; Law 1992; Lewis, 1992), bearing in mind the benefits of regular revaluations as against the costs of doing so.⁷ In particular, under renewal accounting, revaluations could provide a check on whether the amount of maintenance is sufficient to maintain the same level of

⁶ See Chapter 1, p. 3.

⁷ The Statement of Concepts (NZSA, 1993) provides a balance between costs and benefits as a persuasive constraint. Therefore, the frequency with which revaluation is warranted can be considered in cost-benefit terms (Pallot, 1995, p. 12). However, the desirability of precise valuations may not be warranted, with regular revaluations perhaps providing asset valuers in local government with secure fees but perhaps little else (see Young, 1993, p. 32). Nevertheless, the Audit Office is likely to require triennial valuations of infrastructural assets (Simpkins and Jensen, 1995a, p. 26), see Appendix 6.

service potential and would allow any increase or decrease in service potential (due to events not covered by the AMP) to be reported (Simpkins and Jensen, 1995a).

3.3 Conceptual Rigour of Requirements of Renewal Accounting

The conceptual rigour of both the assumption of an indefinite useful life and the use of provisions for deferred maintenance, as required by renewal accounting, have received criticism, particularly by Rowles (see 1991, 1992).

3.3.1 Indefinite Useful Life

Rowles (1991) asserts that the basis for renewal accounting (that an asset has an indefinite useful life), is flawed. The useful lives of all assets are finite, though some may have very long lives, and, “assets will eventually wear out or become obsolete (Rowles, 1991, p. 50). Yet, Rowles (1992, pp. 53-54) appears to contradict himself by stating that some assets, such as infrastructure (network) and heritage assets, can have indefinite useful lives:

Asset service potential may be significantly extended, or continued virtually *indefinitely* with expenditure on maintenance, replacement, renewal or restoration. Sometimes such expenditures are held to extend the service life of assets such that, as a practical consideration, the necessity to depreciate assets is avoided. In this respect a conceptual distinction must be made between component assets, which have finite lives, and the service potential derived from *network* and heritage assets, which may be *preserved indefinitely* with such expenditure [emphasis added].

When viewed as a network, infrastructural assets can have indefinite useful lives, even though individual component assets have finite lives and need to be replaced (see Chapter 2, p. 30, and Chapter 5, p. 85).

3.3.2 Provisions for Deferred Maintenance

Both Rowles (1992) and Paul (1992) argue that provisions for deferred maintenance are inconsistent with the Australian Statement of Concept's (SAC 4, AARF, 1992) definitions of liabilities and expenses. The possibility that expenditure may be undertaken in the future to repair assets does not constitute a present obligation, as required to meet the definition of a liability (Rowles, 1992).⁸ However, renewal accounting views provisions

⁸ The Statement of Concept's (NZSA, 1993) definition of liabilities, which is the same as the Australian Statement of Concepts' SAC 4, is:

Liabilities are the future sacrifices of service potential of future economic benefits that the entity is *presently obliged* to make to other entities as a result of past transactions or other past events (para. 7.10) [emphasis added].

for deferred maintenance both as surrogates for depreciation and as measures of losses of service potential, and therefore as expenses, not as liabilities (Pallot, 1995; SOLGM, 1994a).⁹

3.4 Scope for Manipulation

Renewal accounting may provide scope for management to manipulate provisions for deferred maintenance. Rutherford (1983) argues that, in provision accounting, the size of the provision in any one year will affect the operating result and under or over provisions can be adjusted, thereby effectively 'shifting' the impact of expenditure on repairs and renewals between years. Further, Rowles (1992, p. 57), citing the case of British Rail, argues that one of the principal disadvantages of renewal accounting is the "temptation to use renewals expenditure as a 'regulator' to meet short term profit targets". However, both renewal accounting and traditional depreciation are open to manipulation by management (Simpkins and Jensen, 1995a). Notwithstanding this,

Arguably, accounting-specific changes in depreciation rates which are relatively divorced from the engineering side of infrastructure management may be easier to manipulate than asset management plan changes (Simpkins and Jensen, 1995a, p. 18).

The forms of renewal accounting proposed in recent years require unperformed maintenance to be reported via a provision for deferred maintenance. The amount of renewal expenditure specified in the AMP will be disclosed in the financial statements and will be a separate decision from the funding of it and, therefore, not a discretionary item (CICA, 1989). In any case, the SOLGM guidelines (1994a) state that the financial consequences of any significant change in the requirements for the operational capacity of the system or components (in the AMP) should be explained in narrative form in the financial reports. Therefore, scope for manipulation should be reduced under renewal accounting where the determination of maintenance requirements in the AMP is separate from their actual funding and significant changes in the AMP are disclosed in the financial statements.

⁹ In addition, Pallot (1994, p. 13) indicates that the SOLGM working party considered treating deferred maintenance as a liability but concluded that it did not meet the definition of a liability for the same reasons as Rowles (1992) above. That is, there was no obligation to a party external to the entity. Furthermore, recognising provisions for deferred maintenance as expenses is not precluded under, and indeed is consistent with, the Statement of Concepts (NZSA, 1993), see Chapter 3, p. 47.

3.5 Simplicity and Complexity

Renewal accounting is sometimes advocated because of its simplicity in operation (Stuart, 1992). However, detailed records are needed about the assets comprising the system, practical capacity and maintenance programs needed to be kept under such a system (Paul, 1992). With elaborate engineering records required to support effective management of these systems, simplicity may not be as great as claimed (Rowles, 1992).

It is even suggested that the crucial need for AMPs, and the constant ongoing review inherent with such plans, introduces technical factors which may make the approach to complex to administer (Duncan, 1995; Lewis, 1992). However, both Duncan (1995) and Lewis (1992) refute this, arguing that unless all the critical factors impacting on infrastructural networks are understood by a council, then it cannot hope to assess its performance in managing those assets. Complexity is 'part and parcel' of the management of an effective system of asset management (NSW Treasury, 1989).¹⁰

3.6 Supports Good Management Practice

The need for an accounting method which encourages good management of infrastructural assets was identified in both Chapters 1 and 4. Pallot (1994, 1995) indicates that the introduction of accrual accounting, into both central and local government in New Zealand, has succeeded not so much in achieving accuracy of external reports but in engendering awareness of the need to manage resources properly through requiring asset registers. Moreover, she argues, "the linking of renewal accounting to asset management plans could help to ensure that accounting promotes and supports good management practice" (1995, p. 17).

Renewal accounting is consistent with the way infrastructural assets are operated, managed and maintained (Davin, 1993). It complements and supports good infrastructural asset management because the information required is aligned with the information needs of management, it focuses on maintenance requirements and helps to ensure proper

¹⁰ AMPs are needed to manage infrastructural assets in the long term, irrespective of the accounting method adopted, see Chapter 4.

funding, and it encourages a multi-disciplined and integrated management approach, as discussed in the following sections.

3.6.1 Aligned to Management Information Needs

Renewal accounting seems to facilitate not only financial reporting requirements but also better management of infrastructural assets because the information required is aligned with the information needs of asset managers. For example, Currie (1987, p. 10) states:

The water industry faces many long term planning judgements and is dependent on top quality engineering assessments. Renewals accounting responds and is explicitly linked to these engineering assessments.

Renewal accounting is “practically aligned to the management requirements of the asset manager” (Taylor, 1995, p. 11). Conversely, traditional depreciation is perceived as remote from the management of infrastructural assets (Simpkins and Jensen, 1995a; Smith, 1995; NSW Treasury, 1989).

3.6.2 Focuses on Maintenance Requirements and Ensures Proper Funding

Renewal accounting focuses more clearly on maintenance works requirements compared with revenue restraints (Duncan, 1995; Lewis, 1992). Therefore, it places the onus on the entity to develop long term plans for the maintenance, renewal and reconstruction of its infrastructural assets (Lewis, 1992). Furthermore, it reflects the fact that technology advances are extending the effective life of infrastructural assets (Duncan, 1995; Law 1992; Lewis, 1992).

Renewal accounting also helps to ensure that required maintenance on infrastructural assets is properly funded. It demands greater adherence to the funding principle that operational expenditure should not be funded from debt and/or asset sales proceeds (Lewis, 1992). It relates cost needs more directly to needed expenditures on infrastructural assets, that is, timing differences in cash flows are overcome (Law, 1992, p. 27). In addition, it ensures that the financial accounts record periodic shortfalls in maintenance expenditure (via provisions for deferred maintenance), thus enabling these shortfalls to be addressed and funded in order to maintain the service potential of the assets (Duncan, 1995).

3.6.3 Encourages a Multi-disciplined and Integrated Management Approach

Renewal accounting appears to help accountants and engineers work together more closely and constructively, with greater understanding than has been the case in the past (Law, 1992; Currie, 1987). This is because renewal accounting requires comprehensive AMPs.

AMPs require the active involvement and coordination of several disciplines, including input from engineers, accountants, resource planners and managers of the infrastructural assets (James, 1994; Smith, 1995). The requirement for the various disciplines and departments of an organisation to work and plan together can lead to a more integrated management of both the assets and the organisation (James, 1994). Therefore, renewal accounting, via its requirement for AMPs, encourages a multi-disciplined and integrated management approach among accountants and engineers.

3.7 Recognition of Public Nature of Government

New Zealand local authorities are legally required to consult with their communities in the preparation of their annual plans,¹¹ thus providing “an opportunity to link technical questions for accounting with political processes” (Pallot, 1995, p. 17). Pallot (1995, p. 12) argues, “accounting in government needs to preserve democratic decision making over public funds coercively obtained through rating or taxation”. Furthermore, under renewal accounting, “the measurement of expense by reference to levels of service potential, and associated financing, agreed in open consultation with the public helps to avoid the problem . . .” of unrealistic current values and associated depreciation charges taking over the role of the allocation of public resources (see Aiken (1994, p. 31)), which should be issues for public debate (Pallot, 1995, p. 17). Therefore, where AMPs are agreed in consultation with the public, renewal accounting recognises the public nature of government (Pallot, 1995).

4. Chapter Summary

Three major differences between renewal accounting and traditional depreciation are:

¹¹ See Chapter 4, p. 53, Footnote 3.

- (1) renewal accounting emphasises accounting for the infrastructural network as a whole, and recognises that it has an indefinite useful life. Conversely, traditional depreciation accounts for individual assets within the network separately and emphasises their finite useful lives;
- (2) under renewal accounting, expenditures on renewal and replacement are expensed, whereas under traditional depreciation they are capitalised; and
- (3) the asset's value in the balance sheet is continually written off under traditional depreciation (by the allocation of cost or value), whereas under renewal accounting it is reduced only where maintenance is deferred or a material loss of service potential occurs.

The amount of renewal expenditure on infrastructural assets should equal loss of service potential where systems are in a steady state. Where they are not, accurate reporting of loss of service potential may be achieved by applying some of the alternatives discussed in Chapter 5 (see p. 94 et seq). Renewal accounting may avoid the possibility of double counting and overcome the arbitrary nature of depreciation rates. Both methods require subjective judgement and estimation, though the judgements involved in renewal accounting are likely to be more reliable than judgements made under traditional depreciation. Nevertheless, if either approach is done properly, then each may produce very similar reported expenses in the statements of financial performance and position (see Simpkins and Jensen, 1995a). Arguably, however, renewal accounting is more relevant. It provides relevant and useful information about the performance of management, deferred maintenance and the extent to which infrastructural assets are being maintained, and information useful for assessing the extent to which intergenerational equity is maintained.

Revaluations of infrastructural assets are possible, providing an opportunity to adjust the value of the network in the balance sheet and a check on whether expenditure is sufficient to maintain the network's service potential. However, the costs and benefits of regular revaluations may need to be considered.

The scope for manipulation by management of provisions for deferred maintenance is probably not as great as the scope for manipulating depreciation rates. Under renewal accounting, scope for manipulation should be reduced where the determination of

maintenance requirements in the AMP is separate from their actual funding and significant changes in the AMP are disclosed in the financial statements.

Understanding the complexities inherent in AMPs is necessary if infrastructural assets are to be managed properly, regardless of the accounting method used.

Renewal accounting complements and supports good infrastructural asset management. The information required under renewal accounting is aligned with the information needs of management, it focuses on maintenance requirements and helps to ensure proper funding of maintenance, and, via its requirement for AMPs, it encourages a multi-disciplined and integrated management approach among accountants and engineers.

Finally, renewal accounting recognises the public nature of government, where AMPs are agreed in open consultation with the public (Pallot, 1995).

Chapter 7

RESEARCH METHOD

1. INTRODUCTION.....	116
2. CHOICE AND DESCRIPTION OF THE RESEARCH METHOD	116
2.1 <i>Two-Stage Approach</i>	116
3. LITERATURE REVIEW	117
4. SURVEY METHOD	118
4.1 <i>Data Collection Methods Chosen</i>	119
4.1.1 Personal Interviews.....	119
4.1.2 Telephone Interviews	121
4.2 <i>Selection of Participants</i>	121
4.2.1 Nonprobability Samples	122
4.2.2 Judgemental Sample	122
4.3 <i>Gaining Access</i>	123
4.4 <i>Interview Technique</i>	125
4.4.1 Structure of the Interviews	125
4.5 <i>Data Collection</i>	127
4.6 <i>Data Analysis</i>	127
5. QUALITY OF THE RESEARCH METHOD	128
5.1 <i>Reliability</i>	128
5.2 <i>Validity</i>	129
5.2.1 Biased Results	130
6. CHAPTER SUMMARY	132

1. Introduction

This chapter describes the research method employed for this thesis. First, the choice of research method is outlined. Second, there is a description of the literature review. Third, the survey method is discussed. The survey method, the choice of data collection method, including personal and telephone interviews, the selection of participants and how access to interviewees was gained are described. The interview technique and the design of the interview schedules are then outlined, followed by explanations of how the data was both collected and analysed. Finally, criteria for judging the quality of the research design and the types of errors which can threaten the quality of the research are discussed.

2. Choice and Description of the Research Method

Problems in accounting for infrastructural assets date from requirements in 1989 for New Zealand public sector entities to adopt accrual accounting. There is no generally accepted accounting practice for these assets in New Zealand (Taylor, 1995; Ministry of Commerce, 1994b), and accounting practices among New Zealand local authorities are diverse (Pallot, 1995; Taylor, 1995; Hay, 1994). Furthermore, New Zealand is one of the few countries to have addressed problems in accounting for infrastructural assets on a practical and widespread basis (Pallot, 1995). This research aims to explore recent developments with respect to accounting concepts and practices for infrastructural assets in New Zealand local government.

Emory and Cooper (1991) argue that an exploratory research approach is particularly useful when a clear idea of the problems under study is lacking. Through exploration, concepts can be developed more clearly, priorities established, and, in many other ways, the final research design may be improved (Emory and Cooper, 1991).

2.1 Two-Stage Approach

Following Emory and Cooper (1991), a two-stage approach was adopted for this research. First, a literature review was conducted to determine what has been already written by others on the subject. This had the objective of more clearly defining the research problem and assisting the development of the research design. Second, an experience survey (see p. 118) was conducted to gain the views and insights of key people involved in the issue.

The remainder of this chapter discusses the research method in more detail and illustrates how the two stage approach was used.

3. Literature Review

The literature review included reviewing: research and discussion papers of overseas standard setting and other authoritative bodies, New Zealand literature on accounting for infrastructural assets and renewal accounting, and literature on accounting for public sector infrastructural assets in general.

From the literature review, nine key topics associated with infrastructural assets were identified. These are split into two groups. First, those which relate to infrastructural assets in general:

- (1) Definition;
- (2) Valuation;
- (3) Information systems;
- (4) Equity issues; and
- (5) Financial reporting practices.

Second, fundamental requirements of the renewal accounting approach:¹

- (6) The assumption of an indefinite useful life for the infrastructural network;
- (7) Definitions of revenue (maintenance, renewal and replacements) and capital expenditure;
- (8) Provisions for deferred maintenance; and
- (9) The assumption of a steady state and measuring losses of service potential accurately.

As stated in Chapter 1 (see p. 8), the overall objective of this thesis is to examine recent developments in accounting for infrastructural assets for financial reporting and internal management in New Zealand local government. To address this objective, two research questions were developed:

¹ AMPs are a prerequisite for the use of renewal accounting (see Chapter 5), but are included in the first group of issues since they are necessary for the management of infrastructural assets, irrespective of the accounting method used.

- How are New Zealand local authorities accounting for their infrastructural assets in practice?
- What are the views of persons involved in accounting for, and managing, infrastructural assets, concerning the above issues and the use of renewal accounting?

The nine topics identified above provided the basis for topics discussed during the interviews in the survey of local authorities.

4. Survey Method

The second stage of the research involved conducting an experience survey. Survey research is concerned with methods which involve obtaining information directly from participants by posing questions and recording their responses for analysis (Emory and Cooper, 1991; Dane, 1990). In an experience survey, an interviewer seeks the person's ideas and views about what they consider are the important issues or aspects of the subject (Emory and Cooper, 1991). Emory and Cooper (1991, pp. 145-46) articulate the aims of an experience survey as follows:

While published data are a valuable resource, seldom is more than a fraction of the existing knowledge in a field put into writing. Then, too, even if more is published, it may be difficult to find. Thus, we will profit by seeking information from persons experienced in the area of study. Such persons can help us secure an insight into relationships between variables. To get an accurate picture of the current situation, we need to solicit the views of those believed to know what is going on.

Interviewees from 12 New Zealand local authorities were surveyed. Included in the survey were interviewees from the nine largest city councils. Around half of New Zealand's total population resides in the cities in which these nine councils operate.² They control nearly a third of the total infrastructural assets in New Zealand local government.³ In addition, to obtain the viewpoints of those from a smaller local authority perspective, the

² New Zealand's total population was estimated to be 3.59 million as at 31 March 1995. The population of the nine largest cities in New Zealand is approximately 1.68 million, hence, approximately 47 per cent of the total population (Source: Statistics New Zealand, (1996) *New Zealand Official Yearbook 1996*, 99th ed., Statistics New Zealand, Wellington, May, p. 86).

³ The total value of the infrastructural assets managed by New Zealand local authorities is approximately \$22 billion for the year ended 30 June, 1994 (Simpkins and Jensen, 1995a, p. 1). A review by the author of the 1994 annual report figures for the total infrastructural assets of each of the nine city councils surveyed, revealed that the combined total was approximately \$6.94 billion, thus equal to approximately 32 per cent of the total value of infrastructural assets of New Zealand local authorities (see Appendix 7 for figures on the total infrastructural assets of each local authority surveyed).

surrounding district councils in Canterbury (Waimakariri District Council and Banks Peninsula District Council), were surveyed. Furthermore, an employee from Watercare Services Ltd was interviewed.⁴

4.1 Data Collection Methods Chosen

- The most common methods of data collection used for survey research are: (1) personal interviews, (2) telephone interviews, and (3) mail surveys, or a combination of these (Emory and Cooper, 1991; Dane, 1990; Abdel-khalik and Ajinkya, 1979). To survey the views and experience of key people, personal interviews and telephone interviews were deemed to be the most appropriate methods of data collection. A mail survey, using a questionnaire, would not provide the necessary detail about the concepts related to accounting for, and managing, infrastructural assets. This is because mail surveys are inflexible and do not obtain data with the detail and depth obtained from personal or telephone interviews. Information from personal interviews far exceeds that which can be secured from mail surveys (Emory and Cooper, 1991), because respondents (or interviewees) tend to be more open and more willing to spend their time answering questions (Hanke et al, 1980).

4.1.1 Personal Interviews

The personal interview (face-to-face) is “a two-way conversation initiated by an interviewer to obtain information from a respondent” (Emory and Cooper, 1991, p. 320), or, a conversation with a purpose (Dane, 1990; Merriam, 1990; Bell, 1993).

Personal interviews have the following advantages:

⁴ A recommendation to see someone in Watercare Services Ltd (Watercare Services) was made by a person interviewed in Christchurch. Subsequently, arrangements were made to see an appropriate person involved in accounting for infrastructural assets at Watercare Services.

Watercare Services is owned by the Auckland Regional Services Trust which is an elected body created in 1992 by the Local Government Act. The company is a Local Authority Trading Enterprise (LATE). It has infrastructural assets in the form of water and sewerage assets and supplies bulk water and sewerage services to six territorial authorities in the Auckland region.

It uses a traditional depreciation accounting policy for its infrastructural assets but is also required by Section 707ZF of the Local Government Act to “minimise its prices and charges and to recover only ‘operating costs’ calculated on a special basis by including provision for maintenance and renewals instead of depreciation. This is termed ‘infrastructural accounting’” (Watercare Services Ltd, Annual Report, 1994, p. 2).

- They ensure good sampling techniques since persons interviewed can be carefully selected (Hanke et al, 1980; Emory and Cooper, 1991);
- They allow the interviewer to set up and control interviewing conditions (Emory and Cooper, 1991);
- They allow a thorough and detailed examination of the issues (Emory and Cooper, 1991; Hanke et al, 1980);
- They are very flexible (Emory and Cooper, 1991; Hanke et al, 1980). The interviewer can note the conditions of the interview, probe, answer and use follow-up questions to adapt to unique situations (Bell, 1993; Emory and Cooper, 1991). The interviewer can correct misunderstandings and otherwise re-direct the respondent towards the intended thrust of questions (Brownell, 1995). The language of the interview can be adjusted where problems and effects of the interview on the respondent are observed (Emory and Cooper, 1991).

According to Emory and Cooper (1991, p. 321), successful personal interviews require three broad conditions:

- (1) availability of the needed information from the respondent (i.e. the respondent must have the appropriate knowledge to be able to answer the questions asked of them);
- (2) an understanding of the respondent of his or her role; and
- (3) adequate motivation by the respondent to cooperate.

They argue, “in the successful interview, there is rapport, meaning that a relationship of confidence and understanding exists between interviewer and respondent” (Emory and Cooper, 1991, p. 323).

Despite the above advantages of personal interviews, there are some limitations. The major limitation of personal interviewing is the potential for interviewer bias (Brownell, 1995; Emory and Cooper, 1991; Weisberg et al, 1989). Personal interviews are also very time consuming (Bell, 1993; Emory and Cooper, 1991; Hanke et al, 1980), and expensive in comparison with mail and telephone surveys (Brownell, 1995; Emory and Cooper, 1991; Dane, 1990; Hanke et al, 1980).

4.1.2 Telephone Interviews

The costliness of personal interviewing is even more problematic where the persons to be interviewed are widely dispersed, such as those within territorial authorities throughout the country. To some extent, telephone interviews can aid in the reduction of costs.

The costs of telephone interviewing are typically lower than personal interviews (Emory and Cooper, 1991; Dane, 1990; Weisberg et al, 1989), saving travel costs and time in locating respondents (Brownell, 1995; Emory and Cooper, 1991; Weisberg et al, 1989), and allowing faster completion of the study (Emory and Cooper, 1991). Telephone interviewing may also reduce interview bias when compared to personal interviews (Emory and Cooper, 1991), at least as far as non-verbal behaviour on the part of the interviewer is concerned (Brownell, 1995), though important information content may be lost from being unable to observe the non-verbal behaviour of respondents (Brownell, 1995).

Acceptable interview lengths are considerably shorter than for personal interviews (Dane, 1990; Emory and Cooper, 1991; Weisberg et al, 1989), although the degree of this limitation may depend on the respondent's interest in the topic (Emory and Cooper, 1991). Weisberg et al (1989) argue that people often provide less information in telephone interviews than in face-to-face interviews and that fewer comments are obtained in response to open-ended questions. However, they consider that the differences between the two types of interview are not substantial and note that telephone interviewing is used widely.

4.2 Selection of Participants

Hanke et al (1980, p. 25) state:

In the case of exploratory research, sample selection is not too critical. In most cases it is possible for the researcher to use good judgement in selecting the sample, keeping these characteristics in mind: The sampled persons should have relevant knowledge regarding the problem, be fairly easy to contact and talk with, and be willing to discuss the problem. Since little or no attempt is made to generalize from this sample, such procedures usually suffice.

Thus, probability (random) sampling methods were not used to select the participants to be surveyed. Instead, a nonprobability (nonrandom) method of sampling was used.

4.2.1 Nonprobability Samples

Nonprobability samples have practical advantages over probability samples where the population is not available or there are cost and time constraints (Emory and Cooper, 1991). Nonprobability samples can be categorised into two groups: convenience samples and purposive samples.

The only major criterion used in selecting convenience samples is ease of selection for the researcher (Hanke et al, 1980). Purposive samples, on the other hand, attempt to improve sample selection by applying certain criteria. In purposive sampling, respondents are selected on the basis of what they can contribute to the researcher's understanding of the subject being studied (Merriam, 1990). Merriam (1990, p. 7) states, "in this type of research the crucial factor is not the number of respondents but rather the potential of each person to contribute to the development of insight and understanding of the phenomenon". Purposive samples have the advantages of being inexpensive and they use the best information which is available. However, there are also no estimates as to the accuracy of the sample and important elements may be missed (Weisberg et al, 1989).

Purposive samples can be divided into three categories (Emory and Cooper, 1991):

- (1) judgement sampling (where sample members are hand picked to conform to some criteria,⁵
- (2) quota sampling (where the sample is selected in order to assure that it is representative of the population from which it has been drawn); and
- (3) snowball sampling (where respondents are difficult to identify and are best located through referral networks).

4.2.2 Judgemental Sample

A purposive sampling technique, by way of a judgemental sample, was used to select the key persons to interview. The sample was made up of key employees involved in accounting for, and managing, infrastructural assets within New Zealand local authorities. The criteria for the sample selection were as follows:

⁵ Judgemental samples are primarily used in exploratory research (Hanke et al, 1980).

- to select employees from among the nine largest city councils using renewal accounting or traditional depreciation for their infrastructural assets;
- to select people in local authorities known to have written papers on accounting for infrastructural assets;
- to follow up referrals from people interviewed and others contacted during the research (snowball sampling);
- to contact and interview as many interviewees as possible within the limited time available and budget constraints.

Fourteen interviews were conducted (10 in person and four by telephone⁶) with 13 accounting and five engineering managers from within the 12 local authorities surveyed, as illustrated in Table 7.1 below.⁷

Table 7.1: Interviews Conducted in Surveyed Local Authorities

Council/ Local Authority Surveyed	Interview Type: Personal (P) Telephone (T)	Director of Finance/ Financial Accountant (Accountants)	Director of Works/Asset Manager (Engineers)	Number of Interviews Conducted
Auckland City	P	✓✓ ⁸		1
Manukau City	P	✓	✓	2
North Shore City	P	✓	✓	1
Waitakere City	P	✓	✓	1
Watercare Services Ltd	P	✓		1
Hamilton City	T	✓		1
The Hutt City	T	✓		1
Wellington City	T	✓		1
Christchurch City	P	✓	✓	2
Waimakariri District	P	✓	✓	1
Banks Peninsula District	P	✓		1
Dunedin City	T	✓		1
Total	12	13	5	14

The interviews took place over a six week period from 5 September 1995 to 18 October 1995. The 13 accounting employees interviewed were either the general managers of finance and administration in the local authorities or senior financial accountants who are

⁶ The four telephone interviews with accounting managers enabled the scope of the survey to be expanded by four city councils. Personal interviews could not be conducted with these managers or with engineers in these councils because of time and budget constraints.

⁷ Note that on four occasions, two managers were interviewed at the same time.

⁸ A finance manager and a financial co-ordinator were interviewed from the Auckland City Council. Both were involved in accounting for Auckland City's infrastructural assets.

substantially involved in accounting for infrastructural assets. The five asset managers interviewed were also general managers or senior managers but involved in the engineering management of infrastructural assets. Therefore, 14 interviews were conducted with 18 key people involved in accounting for, and managing, infrastructural assets. This included 13 senior accounting and five senior engineering managers within the nine largest city councils in New Zealand, two district councils in Canterbury and a LATE.

4.3 Gaining Access

Gaining access to the interviewees involved writing to each local authority selected in the sample, outlining who the researcher was, the nature of the study, and why they were being asked to participate in the survey. Covering letters were sent to General Managers of Finance (or Directors of Finance and Administration) asking for their participation.⁹ These letters also asked for a referral to an appropriate senior engineering manager of infrastructural assets within the organisation. Each covering letter was tailored to each council according to their accounting policy for infrastructural assets as well as other factors, such as papers which the interviewee may have written on the topic. Confidentiality was assured and an offer was made to send interviewees a summary copy of the research findings upon the completion of this thesis.¹⁰ Within a week of sending the letters, an appointment was made by telephone. This initial contact took place approximately one month before the interviews.

Bruns (1989, p. 161) expresses that data collection is usually enhanced if:

Those who will be interviewed have a fairly clear idea of the nature of the evidence that the researcher is seeking. In some cases, questions should be sent in advance. . . . Advance notice of what will be discussed helps people organize their thoughts and to answer questions more completely when contact is finally made.

⁹ A copy of the covering letter sent to each local authority can be found in Appendix 8.

¹⁰ Buchanan, Boddy and McCalman (1988) indicate that time and confidentiality are the two most common reservations which can block research access. Access will not be granted where it is felt that normal operations are likely to be disrupted. They suggest that when negotiating access and explaining the nature and purpose of the study, the researcher needs to use non-threatening language and deal positively with respondents' reservations with respect to time and confidentiality. They also suggest that it is helpful to offer a tangible product in return for cooperation. Typically this is a report of the findings, in a form which is useful to the recipients. These suggestions were heeded when negotiating and gaining access to the interviewees.

A confirmation letter was sent to participants approximately one week before the interviews. This gave a broad outline of the topics which the interview would cover, as follows:

- Why [XXXXXX] Council has adopted a renewal/depreciation accounting approach for its infrastructural assets;
- What the mechanics of this approach involve; and
- What the advantages and disadvantages of this approach are.¹¹

Personal interviewees and telephone interviewees were contacted in the same way.

To help reduce awkwardness in conducting interviews by telephone, a small photo of the researcher was attached to each covering letter (see Appendix 8). The interviewees were then able to see what the interviewer looked like when talking with him, in the hope of enhancing good rapport.

4.4 Interview Technique

McCracken (1988, p. 31) states that the first step of the long qualitative interview begins with an exhaustive review of the literature and that:

The . . . purpose of the literature review is to aid in the construction of the interview questionnaire. It begins to establish the domain the interview will explore. It specifies categories and relationships that may organize the data. It helps indicate the larger factors that direct respondent testimony. . . . By the end of the review, the investigator should have a list of topics for which questions must be prepared.

Therefore, the nine issues which were identified from the literature review (listed on p. 117), formed the basis for the preparation of the interview schedules.

4.4.1 Structure of the Interviews

Interviews can be described in terms of the amount of 'structure' which is imposed on the survey instrument (Dane, 1990). On a continuum, at one end there are highly structured interviews directed by a questionnaire, and at the other end, there are more open-ended, conversational formats for, (unstructured) interviews (Merriam, 1990). In an unstructured, or non-directive interview, the interviewer encourages the respondent to discuss the topic and there is very little guidance and very few direct questions (Dane,

¹¹ A copy of the confirmation sent to each participant can be viewed in Appendix 8.

1990). Unstructured interviews (where questions are not prepared), make subsequent analysis very difficult and are generally inappropriate for survey research (Dane, 1990). As McCracken (1988, pp. 24-25) puts it: "the really open-ended interview is an ever-expanding realm of possibility in which the generative power of language is unleashed to potentially chaotic effect". The results of standardised (structured) interviews are easier to aggregate and analyse (Bell, 1993).

A semi-structured interview format was chosen for the interviews. The semi-structured or focused interview format is one that is somewhere between highly structured and unstructured, capturing the advantages of both types of interviews. Semi-structured interviewing is often used in exploratory research where there are complex topics involved which do not lend themselves to more structured forms of interviewing (Emory and Cooper, 1991). An advantage of semi-structured interviewing is that a framework is established beforehand, greatly simplifying analysis (Bell, 1993). Merriam (1990, p. 74) describes the semi-structured interview as follows:

In a semistructured [sic] interview, certain information is desired from all the respondents. These interviews are guided by a list of questions or issues to be explored, but neither the exact wording nor the order of the questions is determined ahead of time. This format allows the researcher to respond to the situation at hand, to the emerging worldview of the respondent, and to new ideas on the topic.

However, McCracken (1988, p. 25) states, "the questionnaire that is used to order data and free the interviewer [to allow the interviewer to give their full attention to the respondent's testimony] must not be allowed to destroy the elements of freedom and variability within the interview". Hence, in a semi-structured interview, the interviewer poses a few predetermined questions, but there is also considerable flexibility concerning follow-up questions. This flexibility enables the opinions of the participants to be explored more fully and therefore the total collection of responses should contain more varied detail than in a structured interview (Dane, 1990).

An interview schedule was used to provide the basis for questions asked in each interview. Based on the nine issues identified from the literature (see p. 117), the schedule was broadly structured around the general questions sent to participants and tailored for each individual local authority; according to their accounting policies for infrastructural assets in their 1994 annual reports and 1994/95 annual plans. The interview schedule was

pretested on several staff members within the Department of Accountancy, Finance and Information Systems at the University of Canterbury.¹²

4.5 Data Collection

Interview schedules were prepared for each interview and notes of the interviewees' comments were made. Interviewees were asked for their permission to have the conversation tape recorded. Permission was obtained in all cases. Confidentiality of interviewees' names was promised.¹³ Personal interviews were typically between 40 and 70 minutes long, whereas telephone interviews tended to be between 25 and 30 minutes long.

A verbatim transcript of each interview was made. This provided a rich source of data for the analysis, allowed the context to be gained within which the questions were asked of the participants, and allowed quotations to be reported with accuracy.

In addition, information on the infrastructural asset accounting policies for each surveyed local authority was obtained from their annual plans and annual reports.

4.6 Data Analysis

The data obtained from the annual reports and plans of the surveyed entities was both summarised and analysed to determine their individual accounting policies for infrastructural assets. Additional information about their accounting policies was gathered from the interviews.

The data obtained from the interview transcripts was analysed by coding various categories identified from the literature (topics used for the interview schedules, see p. 117). Common themes or patterns found within the data collected were identified and also

¹² A copy of the questions contained in a typical interview schedule (used in both the personal and telephone interviews), can be viewed in Appendix 9.

¹³ However, the interviewees did not appear to be overly concerned about confidentiality. When asked for permission to record the conversations, permission was freely granted in all the interviews conducted. A couple of participants even took steps to make sure that the recording of the conversation would be clear. For example, by shutting doors or by positioning seating during the interview so that responses could be clearly picked up by the dictaphone used. Nevertheless, in keeping with the promise of confidentiality, interviewees' names are not disclosed.

used as codes during the analysis. Coding is a method of data reduction used to organise qualitative data into a more meaningful and manageable size¹⁴ (Griggs, 1987, Bryman and Burgess, 1994).¹⁵

The interview transcripts were coded paragraph by paragraph using the codes shown in Appendix 10. These paragraphs were grouped by code and the resulting groups were analysed to ascertain the interviewees' views and explanations of accounting policies and renewal accounting for infrastructural assets.

Common themes and patterns found among interviewees' responses formed the basis of the results presented in Chapters 8 and 9. As the data was being analysed, notes were constantly made, detailing the relationship between the categories identified from the data and concepts involved in accounting for infrastructural assets (see Bryman and Burgess, 1994, p. 5). Tables, summaries or paraphrases of interviewees' statements, and direct quotations were used to display the results. The theoretical framework for this type of analysis, where concepts are derived from categories identified from the data (via coding) and are then used to form hypotheses, can be broadly described as 'grounded theory' (see Bryman and Burgess, 1994; Tesch, 1990; Miles and Huberman, 1984; Glaser and Strauss, 1967).

5. Quality of the Research Method

Two criteria for evaluating the quality of a research method are (1) reliability, and (2) validity (Emory and Cooper, 1990; Bell, 1993; Hanke et al, 1980).

5.1 Reliability

Reliability is concerned with being able to replicate results (Hanke et al, 1980), or the extent to which the operations of the study can be repeated with the same results (Bruns, 1989). The questions which must be answered in the affirmative are: "Would two interviewers using the schedule or procedure get similar results?" or "Would an

¹⁴ The data collected from the interviews amounted to approximately 130 pages of interview transcript.

¹⁵ For further discussion about coding and qualitative data analysis, see Fielding (1993) and Riley (1990).

interviewer obtain a similar picture using the procedures on different occasions?" (Wragg, 1980, p. 17).¹⁶

To aid in determining reliability, the research method used is described in detail in this chapter. Thus, this chapter has sought to illustrate why and how the sample of local authorities was selected, how access was gained to interview participants, the typical questions which interviewees were asked, and how the data was analysed.

5.2 *Validity*

The other major criterion, validity, is concerned with measuring what is intended (Hanke et al, 1980), or whether "an item measures or describes what it is supposed to measure or describe" (Bell, 1993, p. 65). There are two types of validity: external and internal. External validity is concerned with the ability to generalise across populations. It refers to the extent to which the findings of any one study are generalisable to persons, settings and times (Emory and Cooper, 1991). As mentioned earlier, there was little need to generalise across the entire population in this research, hence a judgemental sample was selected. Therefore, the external validity of the findings can be regarded as low and statistical generalisations cannot be made. Despite this limitation, however, generalisations of an analytical or theoretical nature can be made by logical inference (Scapens, 1990; Yin, 1989; Mitchell, 1983). Accordingly, theoretical generalisations may be inferred from the interview data. The validity of these generalisations will therefore depend upon the cogency of theoretical reasoning rather than on the representativeness of the sample (Mitchell, 1983).

Internal validity is defined as "the ability of a research instrument to measure what it is purported to measure" (Emory and Cooper, 1991, p. 180). For personal interviews, internal validity refers to the extent to which the data collected (interviewees' statements) are an accurate representation of interviewees' answers. Internal validity may be improved through good instrument design and an awareness of personal bias in the interview process (Emory and Cooper, 1991; Hanke, et al, 1980; Bell, 1993). However, threats to the internal validity of a study arise from biased results.

¹⁶ Wragg, E.C., (1980) *Conducting and Analysing Interviews*, Rediguide 11, University of Nottingham School of Education, cited by Bell (1993, p. 64-65).

5.2.1 Biased Results

Emory and Cooper (1991) note that biased results arise from three types of error: sampling error, nonresponse error, and response error.

Sampling error arises from using a sample which is not representative of the whole population (Weisberg et al, 1989). As mentioned above, a judgemental method of sampling was used and the results are not intended to be generalised across the entire population of New Zealand local authorities. Furthermore, random sampling techniques may not have selected the appropriate persons with the most relevant expertise and knowledge in this area. The researcher was more interested in obtaining the views and insight into the experiences of key persons involved in accounting for, and managing, infrastructural assets. Arguably, such persons are more likely to be found in larger local authorities, where issues concerning infrastructural assets would appear to be more significant in comparison with smaller local authorities.

Nonresponse error occurs when you are not able to locate whom you are supposed to study (Emory and Cooper, 1991). This is a major concern with all types of surveys (Emory and Cooper, 1991), but response rates for personal interviews tend to be higher than both telephone and mail surveys (Weisberg et al, 1989). However, statistical generalisability is not intended in this thesis, therefore response rates are not a significant issue given the aims of the survey conducted. Nevertheless, all appropriate persons contacted within the local authorities in the sample agreed to participate and granted interviews. Where persons contacted were not available, or did not have the appropriate expertise, the request for an interview was forwarded on to other employees who were deemed to be appropriate.

Response error occurs when the data reported differs from the actual data (Emory and Cooper, 1991). For example, errors can be made in the processing and tabulating of data (Emory and Cooper, 1991). In the case of personal interviews, errors can occur in the recording of interviewees' answers. As already noted, verbatim transcripts of the recorded interviews were made. Thus, this type of response error can be regarded as minimal.

Response error can also occur when interviewees give an incomplete answer (Emory and Cooper, 1991). However, Emory and Cooper (1991) note that this can be overcome to some extent by the interviewer probing for more information or clarifying the question. Other sources of response error that can occur during data collection include:

- (1) inability or unwillingness of the interviewee to answer the question,
- (2) question ambiguity, and
- (3) questionnaire influence (Hanke et al, 1980).

Inability or unwillingness of interviewees to answer questions was minimised first, by contacting appropriate persons with relevant knowledge and experience in the issues, and second, by establishing a rapport with the interviewees and assuring confidentiality. The sources of error due to question ambiguity and questionnaire influence can be minimised by good questionnaire design and pretesting (Hanke, et al, 1980). Thus, as mentioned previously, the interview schedule and the types of questions asked were pretested and revised.

Interviewer bias is one of the major sources of response bias (Emory and Cooper, 1991), which as already noted, is one of the major limitations of personal interviews (Brownell, 1995; Emory and Cooper, 1991; Weisberg, et al, 1989). There are many points in the interview where the interviewer can affect the quality of the data (Emory and Cooper, 1991). Brownell (1995, p. 33) states, "an interviewer who reveals, by whatever means, verbal or non-verbal, any indication of a view about the subject matter at hand will likely bias what the respondent says". In addition, an individual who is untrained or inexperienced would probably introduce more bias into the interview process than a professionally trained interviewer (Richardson et al, 1965).

Emory and Cooper (1991) indicate, though, that there have been many studies on the various aspects of interviewer bias, most of which identify it as a major problem area. However, the findings are at odds as to the exact dimension and conditions under which interviewer bias occurs. The safest thing, they suggest, is to recognise that there is a constant potential for response bias. Likewise, Bell (1993) points out that it is easier to acknowledge that bias can creep in than to eliminate it altogether, and, reiterating Gavron

(1966),¹⁷ although it is difficult to avoid bias completely, awareness of the problem and constant self-control can help.

Fowler (1990) asserts that, during the interview interaction, the interviewer should be neutral and, with regard to feedback, not imply any evaluation or judgement of the content of interviewees' answers. This was borne in mind when conducting the interviews, and an attempt was made to be as neutral as possible. Nevertheless, despite such attempts, it is difficult to maintain a neutral stance and there is likely to be an element of interviewer bias in the data collected, especially since the researcher was not a trained interviewer.

6. Chapter Summary

The research for this thesis is exploratory and is concerned with studying recent developments in accounting for infrastructural assets in New Zealand local government. An experience survey of New Zealand local authorities was undertaken with the aim of further examining the issues identified from the literature by soliciting the views of key employees involved in accounting for, and managing, infrastructural assets (which are presented in Chapter 9). The survey also determined the accounting practices used for infrastructural assets by these local authorities, which are presented in Chapter 8.

Emory and Cooper's (1991) two-stage approach was adopted. First, a literature review was conducted, and second, the views of 13 accounting and five engineering managers employed within 12 New Zealand local authorities were obtained by conducting an experience survey. The survey included 10 personal interviews and four telephone interviews with 18 key people involved in accounting for, and managing, infrastructural assets in 12 New Zealand local authorities. In all, 13 accounting managers and five infrastructural asset managers were interviewed using a semi-structured interview format. This provided coverage of the views of individuals within the nine largest city councils in New Zealand, two district councils, and a LATE.

¹⁷ Gavron, H., (1966) *The Captive Wife*, Routledge & Kegan Paul, London, cited by Bell (1993, p. 95).

The data was analysed via coding techniques and by identifying common themes and patterns. The theoretical framework for this type of qualitative data analysis can be broadly described as 'grounded theory'.

There are two significant limitations of the method employed for this thesis. First, there is a lack of generalisability (low external validity) because of the small sample used and small number of interviews conducted. However, this is permissible for exploratory research such as this (Hanke et al, 1980). A wider coverage of views was not considered important since there is little need to generalise across the entire population of New Zealand local authorities. Despite this limitation, theoretical generalisations are possible through logical inference and analysis of concepts; as they relate to accounting for, and managing, infrastructural assets. Secondly, interviewer bias is likely. Although interviewer bias is difficult to eliminate entirely, it can be minimised by constant awareness of its potential (Bell, 1993; Emory and Cooper, 1991; Gavron, 1966) and good question design (Hanke et al, 1980). This was borne in mind when designing the interview schedules and conducting the interviews.

Chapter 8

ACCOUNTING POLICIES OF SURVEYED LOCAL AUTHORITIES

1. INTRODUCTION	136
2. ACCOUNTING POLICIES OF SURVEYED LOCAL AUTHORITIES	136
2.1 Valuation of Infrastructural Assets	136
2.2 Pipeline Asset Information Systems.....	137
2.3 Asset Management Plans	138
2.4 Accounting Policies of Surveyed Entities.....	138
3. SURVEYED ENTITIES WHICH HAVE ADOPTED RENEWAL ACCOUNTING	139
3.1 Revenue vs Capital Expenditure	140
3.2 Deferred Maintenance Approach to Renewal Accounting	141
3.3 Basis for Calculation of Maintenance Requirements.....	141
3.4 Differences in Renewal Accounting Policies	142
4. SURVEYED ENTITIES WHICH HAVE ADOPTED TRADITIONAL DEPRECIATION.....	143
4.1 Revenue vs Capital Expenditure	144
4.2 Use of Depreciation Funds for Capital Expenditure Programme	144
5. INFORMATION DISCLOSED IN THE FINANCIAL STATEMENTS	144
5.1 Information Disclosed by Entities Using Renewal Accounting	145
5.1.1 Provisions for Deferred Maintenance.....	145
5.1.2 Variation in Disclosure	147
5.2 Information Disclosed by Entities Using Traditional Depreciation	148
6. CHAPTER SUMMARY	149

1. Introduction

This chapter presents the findings of the survey of the 12 local authorities described in Chapter 7. It addresses the first research question as to how local authorities account for their infrastructural assets and how the information is disclosed in their financial statements. The results are a combination of information obtained from each local authority's annual reports and annual plans and the interviews conducted with their employees.

First, the components of the accounting policies of the surveyed local authorities are presented along with the type of accounting policy adopted by each, in terms of renewal accounting or traditional depreciation for infrastructural assets. Second, individual aspects of the renewal accounting and traditional depreciation accounting policies adopted by the surveyed entities are discussed. Third, the disclosure of information on infrastructural assets in the financial statements by the surveyed entities, under both methods, are presented.

2. Accounting Policies of Surveyed Local Authorities

The characteristics of accounting policies and information pertaining to infrastructural assets common to all 12 of the surveyed local authorities include: the valuation method used for infrastructural assets, the asset information system or software used for pipeline infrastructural assets, and the existence of AMPs. These are discussed below, followed by an outline of the accounting policies adopted by the surveyed entities in respect of their infrastructural assets.¹

2.1 Valuation of Infrastructural Assets

Table 8.1 on the next page illustrates the valuation methods used for infrastructural assets by the surveyed entities.

¹ Further details of the individual accounting policies of the surveyed local authorities can be found in Appendix 11 and Appendix 12. The summaries of these two appendices form the basis of the results presented in this chapter.

Table 8.1: Valuation Methods Used by Surveyed Local Authorities

Valuation Method	No. of Entities
Depreciated Replacement Cost	10
Optimised Depreciated Replacement Cost	1
Method Not Disclosed	1
Total	12

With the exception of one local authority which used optimised depreciated replacement cost, and another which did not disclose its method, 10 entities used the depreciated replacement cost (DRC) method to value their infrastructural assets.

2.2 Pipeline Asset Management Information Systems

In Chapter 4, it was noted that the information on roads is generally very good in New Zealand local authorities, due to the role of Transit New Zealand and the use of the RAMM (Road Assessment Maintenance Management) system. Conversely, there is a lack of information and formal asset information systems for pipeline assets but it was also noted that the majority of local authorities have subscribed to the PAMS (Pipeline Asset Management System), as Table 8.2 shows.

Table 8.2: Asset Management Information Systems Used for Pipelines

Pipeline Asset Management Information System Used	No. of Entities
Pipeline Asset Management System (PAMS)	9
Entity commissioned own pipeline management system	2
Pipeline asset management system not disclosed	1
Total	12

All of the local authorities, except for Watercare Services Ltd,² are implementing these asset information systems and collecting information on their pipeline assets. Once this information is collected and entered into the PAMS or similar system, this will enable AMPs to be completed.

² Watercare Services Ltd has an asset information system for its infrastructural assets but the type of system used was not determined from the interview.

2.3 Asset Management Plans

The majority of surveyed local authorities are continuing to develop their AMPs for all of their infrastructural assets, as Table 8.3 shows.

Table 8.3: Existence of Asset Management Plans in Surveyed Local Authorities

Existence of Asset Management Plans	No. of Entities
Still developing AMPs for all infrastructural assets	8
AMPs completed for some but not for all infrastructural assets	3
AMPs completed for all infrastructural assets	1
Total	12

Except for one entity, all of the surveyed entities have yet to complete AMPs for some or all of their infrastructural assets. However, a few of the larger local authorities indicated that some of their AMPs would be completed in the near future. Full completion would involve both consultation with the public and approval within the council before final adoption of the plans.³

2.4 Accounting Policies of Surveyed Entities

Table 8.4 on the next page shows, in respect of the surveyed local authorities for the four years 1992-1995,⁴ those entities which use renewal accounting, those which use traditional depreciation, and those which use a mixture of renewal accounting and traditional depreciation for their infrastructural assets.⁵

Key to Table

- R** – Uses a renewal accounting policy, where expenditure on maintenance and renewal is expensed in the operating statement and usually a provision is made for deferred maintenance (where applicable) and deducted from the value of the asset in the balance sheet.
- D** – Uses a traditional depreciation accounting policy, where the straight-line method of depreciation is used to allocate the cost of infrastructural assets over their estimated useful lives.
- R/D** – Has a mixture of a renewal and a traditional depreciation accounting policy.
- No Depn** – Did not depreciate its infrastructural assets.

³ For a discussion of interviewees' views on AMPs for infrastructural assets, see Chapter 9, p. 158 et seq.

⁴ Note that Table 8.4 includes 1995 policies, but because the interviews were conducted prior to the release of the 1995 annual reports, information presented elsewhere in the chapter relates to pre-1995 policies.

⁵ See Appendix 7 for additional information about the general population, total assets, and total infrastructural assets for each local authority.

Table 8.4: Accounting Policies for Infrastructural Assets of Surveyed Local Authorities⁶

LOCAL AUTHORITY	1995	1994	1993	1992
Auckland City Council	R	R	R	R
Manukau City Council	R	R	R	R
North Shore City Council	R	R	R	No Depn
Waitakere City Council	R ⁷	R/D	R/D	R/D
Watercare Services Ltd	R/D	R/D ⁸	R/D	No Depn ⁹
Hamilton City Council	D	D	D	D
The Hutt City Council	R	R	D	D
Wellington City Council	D	D	D	D
Christchurch City Council	D	D	D	D
Waimakariri District Council	R/D ¹⁰	R/D	R/D	R/D
Banks Peninsula District Council	R	R	No Depn	No Depn
Dunedin City Council	R/D	R/D ¹¹	D	D
TOTAL WITH RENEWAL POLICY	6	5	3	2
TOTAL WITH DEPRECIATION POLICY	3	3	5	5
TOTAL WITH MIXED POLICY (R/D)	3	4	3	2
TOTAL WITH NO DEPRECIATION	0	0	1	3
TOTAL NUMBER OF AUTHORITIES	12	12	12	12

The diversity in practice is clear. However, there appears to be a trend towards an increasing use of renewal accounting among the surveyed entities. Local authorities are using either a mixture of renewal accounting and traditional depreciation, or renewal

⁶ As indicated in the annual reports or annual plans of the respective local authorities.

⁷ Waitakere City Council appears to have applied renewal accounting to all of its infrastructural assets in its 1995 annual report despite depreciating its bridges (on a straight line basis over a 100 year estimated useful life) in previous years.

⁸ Note that Watercare Services Ltd depreciates its water and sewerage fixed assets on a straight line basis in its annual report. It is also required by legislation to prepare accounts on a renewal accounting basis.

⁹ Watercare Services was created in 1992 under the Local Government Act (Watercare Services Ltd, 1994) and, presumably, did not record depreciation for that year.

¹⁰ Waimakariri District Council applies a mixed policy, where additions to infrastructural assets are depreciated down to 50% of their value and then accounted for by renewal accounting thereafter. It also depreciates its bridges separately.

¹¹ Dunedin City Council did not depreciate its roading formation or roading surface pavement in the 1993/94 financial year. Instead, it indicated: "[r]oad surface pavement is to be kept at a permanent non-deteriorating condition with the application of a Maintenance Plan" (1994, p. 92). However, other infrastructural assets, such as drainage and water reticulation, continue to be depreciated on a straight-line basis, as well as bridges and street lighting.

accounting for all of their infrastructural assets, and fewer entities are using traditional depreciation for all of their infrastructural assets.¹² In both 1994 and 1995, some form of renewal accounting was used by nine of the 12 local authorities surveyed.

3. Surveyed Entities which have Adopted Renewal Accounting

The main characteristics of the accounting policies adopted by the nine surveyed local authorities who used some form of renewal accounting are presented below. These include: revenue versus capital expenditure and proportional allocation, provisions for deferred maintenance, and the basis upon which required maintenance on infrastructural assets is calculated. In addition, variations on the general or common types of renewal accounting policies adopted by the surveyed entities are identified and discussed.¹³

3.1 Revenue vs Capital Expenditure

For the majority of the nine entities using some form of renewal accounting, expenditure which maintains the present capacity of the system and does not extend or increase the overall service capacity of the network was generally regarded as revenue expenditure. Terms used to describe revenue expenditure included: renewal and replacement expenditure, operational expenditure, maintenance expenditure, major maintenance expenditure and routine maintenance expenditure. Renewal expenditure would typically include: pipe replacement, pump replacement in sewerage pumping stations, and the resealing of road surfaces. Additionally, two entities separately classify their revenue expenditure into two groups in the operating statement: (1) routine (or normal) maintenance expenditure, which includes the day to day repairs on assets, greasing and lubrication of parts, and cleaning, sweeping and potholing of roads; and (2) renewal and replacement (revenue) expenditure.

¹² In addition, an interviewee from the Christchurch City Council indicated that renewal accounting will be adopted by the Council in the 1997/98 financial year.

¹³ Further details of the individual accounting policies of the surveyed local authorities can be seen in Appendices 11 and 12.

Capital expenditure was usually described as expenditure which creates new assets and extends or significantly enhances the overall service capacity of the system, for example, adding a lane on a road or extending a road through a new subdivision.

Five of the nine entities using renewal accounting indicated that they apportion expenditure which both renews and increases the service capacity of an asset between renewals and capital expenditure (i.e. proportional allocation). In contrast, Auckland City Council does not pursue this policy.¹⁴ Moreover, three entities using renewal accounting were not surveyed on their use of proportional allocation of expenditure.¹⁵

3.2 Deferred Maintenance Approach to Renewal Accounting

The large majority of entities using renewal accounting (eight out of nine entities) use a deferred maintenance approach. Provision is made for deferred maintenance where applicable and shown as a deduction from the gross value of the asset in the balance sheet. Watercare Services Ltd treats unperformed maintenance and maintenance performed in advance as accruals and prepayments, as recommended in the Price Waterhouse guidelines (1989).

3.3 Basis for Calculation of Maintenance Requirements

The majority of local authorities do not have AMPs capable of specifying the annual maintenance required on their infrastructural assets. The basis upon which the nine entities using renewal accounting calculate maintenance, is shown in ascending verifiability in Table 8.5 on the next page.

¹⁴ Auckland City Council does not regard minor changes in technology as capital expenditure, as seen in the definition of maintenance which it has adopted; "... maintenance includes the cost of restoration or replacement of portions of existing asset networks at greater or less capacity than existed previously with or without improvements in technology" (Auckland City Council Annual Report, 1994, p. 21). The Auckland interviewees' reasons for why Auckland City Council does not use proportional allocation are discussed in Chapter 9.

¹⁵ One of these entities, Watercare Services Ltd, does not actually use renewal accounting for financial reporting purposes but uses it only for calculating its prices. However, the interviewee noted that they had based their infrastructural accounting policy (renewal accounting) on the basis of the UK water industry guidelines, that is, the Price Waterhouse (1989) and OFWAT (1993a) guidelines. The Price Waterhouse guidelines (1989) recommend the use of proportional allocation, and, therefore, it can reasonably be assumed that Watercare Services would use proportional allocation if it were to use renewal accounting for financial reporting purposes.

Table 8.5 shows that only two entities have formal AMPs in place for their infrastructural assets and the other seven base required maintenance on the 'best estimates' or 'best guesses' of engineers.¹⁶ Some interviewees indicated that without the necessary information on pipeline assets to determine maintenance requirements, maintenance is carried out in a reactive fashion – if a pipe breaks it gets fixed.

Table 8.5: Basis for Calculation of Maintenance Requirements

Calculation of Maintenance Requirements	No. of Entities
Based on engineers' best estimates with no AMP	5
Based on engineers' best estimates with no AMP but estimates are reviewed externally	2
Based on estimates from the AMP	2
Total	9

Watercare Services Ltd is one of the few entities with fully developed AMPs, using them to determine its maintenance requirements for its bulk water and sewerage assets. It calculates its prices on an infrastructural accounting basis by looking at its capital expenditure budget and recasting the figures into what would be classed as infrastructural renewal expenditure under renewal accounting.¹⁷

In addition, two entities used external engineering consultants to prepare, or review, the estimates of the maintenance required on infrastructural assets.

3.4 Differences in Renewal Accounting Policies

The majority of entities using renewal accounting apply it to all of their infrastructural assets. There are, however, some variations in practice, where some infrastructural assets are depreciated in the normal way.

¹⁶ Note, however, that to the best of the author's knowledge, all of the surveyed local authorities, except Watercare Services Ltd, have the RAMMS system (Road Asset Maintenance Management System) installed for their roading infrastructural assets and would base their maintenance requirements for roading on this. Nonetheless, the large majority of the surveyed entities still do not have fully completed AMPs for their roading infrastructural assets upon which the amount of maintenance required on infrastructural assets should be based and also to demonstrate that the network's service potential is being maintained.

¹⁷ Watercare Services does not actually prepare a separate set of accounts on a renewal basis but uses a spreadsheet on a computer to model the required projections once an assessment of the asset condition is made. The model then uses a schedule of expected works and uses these variables as a basis for a cash flow model. The price and debt levels are then modelled from this.

Depreciating new asset systems and major sub-components of the network was identified in the literature (see Chapter 5, pp. 94-95). Two entities in this survey are using such methods to deal with the renewals holiday and potential for 'lumpiness' in expenditure patterns with major sub-components of the network.

Waimakariri District Council depreciates its infrastructural assets down to 50 per cent of their value. Its 1994 statement of accounting policies stated:

In respect of infrastructural assets for items covered by the asset maintenance programme, additions since 30 June 1991 are depreciated on a straight line basis to a residual value of 50%. Once they reach this level no further depreciation is charged on the rationale that they are maintained at this level in perpetuity by the asset maintenance programme (Waimakariri District Council, 1994, p. 19).

Once the assets are depreciated to 50 per cent, the council uses renewal accounting and expenses the cost of the renewals to the operating statement. This practice is used for assets within the pipeline and roading systems which are new and do not need replacing in the early years of their useful life. Pipes are depreciated at 2 per cent per annum for 25 years on an assumption of a 50 year life.

Waimakariri District Council also distinguishes between pipes and roading assets and other assets, such as pumps and bridges over 20 metres. The former types of assets are accounted for in the way described above while the latter are fully depreciated. This policy distinguishes component parts of the network which can be separately identified from the other assets which make up the network. This treatment is also practiced by the North Shore City Council, which classifies its sewerage treatment plant as a fixed asset, and presumably depreciates it as such.

4. Surveyed Entities which have Adopted Traditional Depreciation

Table 8.4 showed that six of the surveyed local authorities used some form of traditional depreciation accounting for their infrastructural assets in 1995. Three of these entities used traditional straight-line depreciation for all of their infrastructural assets. The other three had adopted a mixed accounting policy. One entity used traditional depreciation for all its infrastructural assets, except for roading. Another used a hybrid renewal accounting

approach, as described above in the last section on Waimakariri District Council's policy. Another, Watercare Services Ltd, used traditional depreciation for all of its infrastructural assets and also renewal accounting for pricing purposes.¹⁸

4.1 Revenue vs Capital Expenditure

For entities using traditional depreciation, revenue expenditure was identified as that which maintains but does not significantly improve or extend an asset's estimated useful life or service capacity. Capital expenditure was identified as that which creates new assets and anything which significantly enhances the service capacity or service potential and the estimated useful lives of individual infrastructural assets. Pipe and pump replacements, which are capital expenditures under traditional depreciation, would be treated as renewal expenditure and classed as revenue expenditure under renewal accounting. Two local authorities classify their capital expenditure into categories. For example, Christchurch City Council has four categories of capital expenditure: Renewals and Replacements, Asset Improvements, New Assets and Major Enhancement Projects.

4.2 Use of Depreciation Funds for Capital Expenditure Programme

Two of the surveyed entities which used traditional depreciation indicated that funds generated from depreciation are specifically applied to their capital expenditure programmes. This does not seem to affect the funding of capital works in itself, but simply reflects the way in which these Councils view them in their renewal and capital expenditure programmes.

5. Information Disclosed in the Financial Statements

The following sections present how the surveyed entities, both those using renewal accounting and those using traditional depreciation, disclose information in the financial statements for their infrastructural assets.

¹⁸ Further details on the individual accounting policies of the surveyed local authorities using traditional depreciation accounting can be viewed in Appendix 11 and Appendix 12.

5.1 Information Disclosed by Entities Using Renewal Accounting

For entities using renewal accounting, an overall aggregate figure for infrastructural assets is disclosed in the balance sheet. More detail is provided in the notes to the financial statements, showing the individual infrastructural assets and their values. For illustration purposes, Exhibit 8.1 below shows an extract from North Shore City Council's 1994 Annual Report.

Exhibit 8.1: Disclosure of Information on Infrastructural Assets by Entity using Renewal Accounting¹⁹

North Shore City Council				
NOTES TO THE FINANCIAL STATEMENTS				
YEAR ENDED 30 JUNE 1994				
INFRASTRUCTURAL ASSETS				
	Cost/ Valuation 1 July 1993 \$000	Additions \$000	Valuation and/or Other Adjustments \$000	Cost/ Valuation 30 June 1994 \$000
Sewerage reticulation	165,124	2,892	(219)	167,797
Roading network	152,729	10,129	—	162,858
Bridges	7,647	—	—	7,647
Stormwater system	50,356	3,133	—	53,489
Water reticulation	46,145	1,797	12	47,954
Refuse and Recycling	209	—	—	209
	422,210	17,951	(207)	439,954
	Provision For Major Maintenance 1 July 1993 \$000	Provision 1993/94 \$000		Provision For Major Maintenance 30 June 1994 \$000
Sewerage reticulation	6,032	1,548		7,580
Roading network	8,643	4,356		12,999
Bridges	570	285		855
Stormwater system	1,811	656		2,467
Water reticulation	1,512	449		1,961
	18,568	7,294		25,862
Net Book Value	403,642			414,092

Provision is made for deferred maintenance and deducted from the value of the infrastructural assets. Infrastructural assets are shown at cost or valuation, any additions to the assets are disclosed, and comparative figures from the previous year are also shown. Actual maintenance and renewal expenditure on infrastructural assets, as well as

¹⁹ Extract from: North Shore City Council (1994) *North Shore City Council Annual Report 1993/94*, North Shore City Council, Takapuna, North Shore City, Auckland, Note 18, p. 44.

provisions for any deferred maintenance, are also disclosed in the individual significant activity statement for each infrastructural asset held by the local authorities. The overall operating statement and balance sheet for the entity as a whole is made up of each of these individual statements.

5.1.1 Provisions for Deferred Maintenance

To disclose the extent of maintenance and deferred maintenance on infrastructural assets, a few local authorities provided a summary of the renewal accounting figures for each asset in addition to the detail provided in the notes. For example, the North Shore City Council displayed a 'Renewal Accounting Summary' in addition to the figures which can be seen in the individual significant activity operating statements and in the overall financial statements for infrastructural assets. This is reproduced in Exhibit 8.2 below.

Exhibit 8.2: Renewal Accounting Summary

North Shore City Council RENEWAL ACCOUNTING - SUMMARY For The Year ended 30 June 1994²⁰			
	Major Maintenance Expenditure \$000	Provision For Major Maintenance \$000	Total \$000²¹
Roading and Traffic Services	2, 457	4, 641	7, 098
Water Supply	696	449	1, 145
Stormwater and Flood Protection	308	656	964
Wastewater Services	1, 705	1, 548	3, 253
Parks and Civic Areas	567	433	1, 000
	5, 733	7, 727	13, 460

Using a separate summary to disclose provisions for deferred maintenance was also provided by The Hutt City Council. Alternatively, two entities did not use such summaries but disclosed provisions for deferred maintenance in the overall summary of infrastructural assets in the notes to the financial statements (similar to the illustration in Exhibit 8.1).

²⁰ Extract from: North Shore City Council (1994) *North Shore City Council Annual Report 1993/94*, North Shore City Council, Takapuna, North Shore City, Auckland, p. 32. Note: the totals of the provisions for major maintenance for 1994 in both Exhibit 8.1 and 8.2 do not correspond for two reasons. First, Parks and Civic Areas are included in Exhibit 8.2 because North Shore City also applies renewal accounting to these assets, and second, the provision for Roothing and Traffic Services in Exhibit 8.1 is a combination of both the provisions for the Roothing Network and Bridges in Exhibit 8.1.

²¹ Note: The total of the amount of major maintenance and provision for major maintenance is the estimate of the average annual expenditure required on existing infrastructural assets. The provision for major maintenance is the difference between this average annual estimate and the actual expenditure incurred (North Shore City Council, 1994, p. 8).

Another local authority indicated that it had carried forward a provision for deferred maintenance on its infrastructural assets. This was disclosed within the section of the annual report where significant changes in accounting policies are outlined. However, the amount of maintenance deferred on each infrastructural asset was not disclosed. On the other hand, three entities stated that the amount of maintenance on infrastructural assets had been sufficient to maintain them in perpetuity and, therefore, there was no provision for deferred maintenance required.

5.1.2 Variation in Disclosure

Auckland City Council (Auckland City) used a slightly alternative format to disclose information on its infrastructural assets, as shown in Exhibit 8.3 below.

Exhibit 8.3: Alternative Disclosure of Information on Infrastructural Assets²²

Auckland City Council

NOTES TO THE FINANCIAL STATEMENTS YEAR ENDED 30 JUNE 1994

INFRASTRUCTURAL ASSETS

The value of these assets at
30 June 1994 is:

	Roading Assets \$000	Drainage Systems \$0000	Water Reticulation Systems \$000	Total \$000
Optimised Replacement Cost	1, 562, 067	1, 438, 908	379, 609	3, 380, 584
Less:				
Accrued Maintenance	981, 965	861, 564	179, 809	2, 023, 338
Deferred Maintenance	13, 165	2, 208	83, 983	99, 356
Total Maintenance Provisions	995, 130	863, 772	263, 792	2, 122, 694
Net Asset Value	566, 937	575, 136	115, 817	1, 257, 890

Consistent with the other surveyed entities, disclosure of information on infrastructural assets by Auckland City is shown in the notes to the financial statements. Yet, unlike other entities, infrastructural assets are shown at optimised depreciated replacement cost (ODRC) less both provisions for deferred maintenance and, more interestingly, 'accrued maintenance'.

The provision for accrued maintenance is an attempt to reflect the extent to which the service potential (or useful life) of the assets has already been consumed, as explained by

²² Extract from: Auckland City Council, (1994) *Auckland City Council Annual Report 1993-1994*, Auckland City Council, Auckland, Note 11, p. 27.

one of the interviewees; "Accrued maintenance is intended to show the readers [of the financial reports] the extent to which the assets have progressed through their useful life".

5.2 Information Disclosed by Entities Using Traditional Depreciation

For all of the entities using traditional depreciation, the rates or estimated useful lives with which infrastructural assets had been depreciated by were disclosed in their annual reports in the Statement of Accounting Policies. Similar to entities using renewal accounting, information was aggregated in the overall operating statements and an amount for the depreciation on each infrastructural asset was shown in the individual operating statements for each significant activity. The notes to the financial statements showed for each infrastructural asset: cost or valuation, the effect of any revaluations, any additions or improvements, the depreciation for the current period and the amount of accumulated depreciation. For illustration purposes, an extract from Christchurch City Council's 1994 annual report is reproduced in Exhibit 8.4 below.

Exhibit 8.4: Disclosure of Information on Infrastructural Assets by Entity using Traditional Depreciation²³

Christchurch City Council NOTES TO THE FINANCIAL STATEMENTS YEAR ENDED 30 JUNE 1994

Infrastructural Assets:

These assets shown in the Statement of Financial Position of Christchurch City Council are for:

	Valuation or Cost \$000's	Accumulated Depreciation \$000's	Value 30th June 1994 \$000's	Value 30th June 1993 \$000's
Bus Shelters	99	7	92	85
Roading	759, 209	34, 129	725, 080	720, 465
Sewers	209, 447	12, 008	197, 439	198, 789
Stormwater	180, 030	8, 684	171, 346	170, 938
Water Reticulation	122, 013	4, 989	117, 024	115, 848
Water Meters	4, 550	767	3, 783	3, 082
Streetlights	9, 854	1, 502	8, 352	8, 526
Traffic Lights	3, 547	830	2, 717	2, 926
Water Pumping	9, 115	2, 769	6, 346	6, 452
Waste Pumping	4, 679	1, 482	3, 207	3, 260
	\$1, 302, 543	\$67, 157	\$1, 235, 386	\$1, 230, 371

The aggregate figure for infrastructural assets (\$1, 235, 386, at 30/6/94) is displayed in the balance sheet.

²³ Extract from: Christchurch City Council, (1994a) *Christchurch City Council Annual Report 1994*, Christchurch City Council, Christchurch, 23 December, Note 29, p. 27.

6. Chapter Summary

Nearly all of the surveyed local authorities:

- use the depreciated replacement cost basis for valuing their infrastructural assets;
- are in the process of collecting information and implementing the PAMS system for their pipeline infrastructural assets; and
- are still developing AMPs for all of their infrastructural assets.

There appears to be a trend towards an increasing use of renewal accounting among the surveyed entities. Most of the nine surveyed entities used a deferred maintenance approach to renewal accounting for their infrastructural assets in both 1994 and 1995. Despite minor variations, there is some uniformity in the renewal accounting approaches adopted by these nine entities. The common features include:

- Revenue (renewal) expenditure maintains and does not extend or increase the overall service capacity of the network;
- Capital expenditure creates new assets and extends or significantly enhances the overall service capacity of the system;
- Expenditure which both replaces and enhances overall service capacity is apportioned between renewal and capital expenditure (i.e., proportional allocation);
- Provision is made for deferred maintenance where applicable; and
- Annual maintenance required on infrastructural assets is calculated on the basis of engineers' best estimates.

Hybrid renewal/depreciation accounting policies adopted included: (1) depreciating infrastructural assets down to 50 per cent of their value and then expensing maintenance and renewal expenditure on these assets, as practiced by the Waimakariri District Council, and (2) depreciating separately identifiable assets from other infrastructural assets, such as bridges and sewerage treatment plants.

Despite the common features of the renewal accounting policies adopted by the surveyed entities, they also have in common the lack of formal asset information systems (e.g. PAMS) and fully developed AMPs upon which their maintenance requirements should be based. A few entities used independent external engineers to prepare and review maintenance estimates.

Six of the surveyed entities used the straight-line method of depreciation (traditional depreciation) for some or all of their infrastructural assets. Three entities used a mixture of depreciation and renewal accounting for their infrastructural assets, and two entities specifically earmarked the funds generated from depreciation on infrastructural assets to fund their capital works programmes.

A few entities, using renewal accounting, disclosed information on maintenance and provisions for deferred maintenance by using 'Renewal Accounting Summaries', in addition to the information on infrastructural assets found elsewhere in the financial statements.

Chapter 9

INTERVIEWEES' VIEWS

1. INTRODUCTION	152
2. ACCOUNTING FOR AND MANAGING INFRASTRUCTURAL ASSETS	152
2.1 <i>Defining Characteristics of Infrastructural Assets</i>	152
2.2 <i>Valuation of Infrastructural Assets</i>	154
2.3 <i>Information on and AMPs for Managing Infrastructural Assets</i>	155
2.3.1 <i>Difficulties in Determining Annual Maintenance Requirements for Pipelines</i>	157
2.3.2 <i>Asset Management Plans</i>	158
2.4 <i>Increases in Expenditure Expected and Intergenerational Equity</i>	161
2.5 <i>GAAP for Infrastructural Assets and Renewal Accounting</i>	163
2.6 <i>Depreciation Funds Used for Capital Expenditure – Similar to Renewal Accounting?</i>	165
3. REQUIREMENTS OF RENEWAL ACCOUNTING	166
3.1 <i>Indefinite Useful Life</i>	166
3.2 <i>Revenue vs Capital Expenditure</i>	167
3.3 <i>Provisions for Deferred Maintenance</i>	170
3.4 <i>Steady State, Lumpiness and Obsolescence</i>	172
3.4.1 <i>Steady State</i>	172
3.4.2 <i>Obsolescence</i>	173
4. CONSIDERATIONS RELEVANT TO USING RENEWAL ACCOUNTING	174
4.1 <i>Conceptual Merit/Logic of Accounting Method</i>	175
4.2 <i>Transparency</i>	176
4.3 <i>Reliability</i>	176
4.4 <i>Management Support</i>	178
4.5 <i>Practicality</i>	178
4.6 <i>Costs of Information</i>	179
4.7 <i>Understandability</i>	180
4.8 <i>Funding Implications</i>	180
5. CHAPTER SUMMARY	181

1. Introduction

This chapter presents the views of the 18 interviewees surveyed (13 accounting managers and five engineering managers) with respect to the nine issues identified from the literature in Chapter 7 (see p. 117), thereby addressing the second research question.

The chapter is split into three main parts. Section 2 presents interviewees' explanations of accounting for, and managing, infrastructural assets (the first five issues identified in Chapter 7). Interestingly, one issue was raised that was not found in the literature, and this is dealt with at the end of Section 2. Sections 3 and 4 relate specifically to interviewees' explanations and views about renewal accounting. Section 3 presents interviewees' views on how the renewal accounting method works or should work (the remaining four issues outlined in Chapter 7). Section 4 describes interviewees' opinions about the relative merits or demerits of the renewal accounting method.

2. Accounting for and Managing Infrastructural Assets

This section presents interviewees' explanations of six issues (including issues (1) to (5) in Chapter 7) which are related to accounting for, and managing, infrastructural assets in general.

2.1 Defining Characteristics of Infrastructural Assets

Interviewees identified a number of characteristics with respect to defining infrastructural assets.

Two-thirds of the interviewees (12) regarded infrastructural assets as systems or networks made up of individual component assets. For instance, one interviewee stated:

... we look at the system, say our sewerage system, as being the asset rather than being a collection of little assets. So we look at the system, but then we say that the system has a whole lot of components.

Typical examples provided include: roading, water, sewerage and stormwater systems. Moreover, the SOLGM's definitions (1992, 1994a), which incorporate the fact that infrastructural assets are networks or systems, were used by a moderate number of

interviewees (7). Interviewees from three councils indicated that they used the SOLGM (1992, p. 22) definition in their annual reports:

Infrastructural assets are fixed utility systems that provide a continuing service to the community and that are not generally regarded as tradeable. These assets include roads, water and sewerage services and stormwater systems.

The SOLGM guideline's (1994a, p. 1) definition was used by three interviewees:

Infrastructural assets include those stationary systems where the system as a whole is intended to be maintained indefinitely at a specified level of service potential by the continuing replacement and refurbishment of its components. The total system is therefore a network which can include normally recognised 'ordinary' assets as components.

Half of the interviewees (9) indicated that an essential characteristic of infrastructural assets is that they are maintained in perpetuity or indefinitely. Such assets need to provide an ongoing service at a relatively constant level of service performance, until they are no longer needed. For example, one interviewee stated that, for roading assets, their defining characteristic is:

... they're an infrastructural asset, and as such, they're an asset in perpetuity. Whereas a fixed asset will be thrown away at some stage, your road isn't thrown away, it's just maintained or reconstructed etc., until such time as we don't need roads any more and we're all flying everywhere or teleporting, or something.

In contrast to the majority of opinion, a minority of interviewees (4) argued that if public sector infrastructural assets were controlled by private sector entities, then they would be classified and treated differently, that is, they are not distinct. Two interviewees argued that if local authority infrastructural assets were held by commercial or private sector entities, then they would be viewed as liabilities because the assets produce a net outflow of dollars. Furthermore, two interviewees suggested that if their Council operated on a commercial basis and its infrastructural assets were tradeable, then they might be classified and treated as ordinary fixed assets. As one interviewee stated, if the water supply could be sold by the council,

... they probably wouldn't be termed 'infrastructural assets' any more. It would be just 'water reticulation system'. ... So you'd have something that becomes tradeable. So, you'd have to redefine it.

Therefore, he argued, they would just be fixed assets and the term "infrastructural assets" would disappear.

Only a small minority of interviewees (3) indicated that infrastructural assets are held by local authorities for the benefit and use of the community, while others (3), regarded such

assets as not generally tradeable. One interviewee drew a distinction between infrastructural assets which are held for the benefit of the community and those on which there is a commercial objective to make a profit. With respect to the roading system of the city:

... the benefit is there for the community and the industry and commerce to be able to move goods and people and all those other things around.

Three interviewees stated that local authority infrastructural assets are generally not regarded as tradeable assets; they can be differentiated from other fixed assets which can normally be bought and sold.

Additionally, two interviewees indicated that there are some grey areas when determining which assets are classified and included as infrastructural assets and which assets are not. One interviewee, with regard to defining and classifying infrastructural assets, stated:

In concept, you can come up with quite an easy definition—it's assets that you aim to maintain in perpetuity, excluding short lived assets such as computers, furniture and vehicles. That's the general concept, but you get in the middle, there, a grey area. Plant control systems... where do they sit? Are they a fundamental part of the plant which you're maintaining? Or, are they more like an office computer that you just depreciate normally? There is no absolute answer and I think mostly it's a convenience factor—get a definition and stick with it.

Determination of the types of assets which should be classified as infrastructural assets may be made on the basis of the asset's association or function within the overall network. As one interviewee stated:

It's a question of function more than anything. ... I think the general view is that if it's critical to the overall operation of our system, then it's infrastructural. If it's incidental, it's just ordinary operations.

Parks and reserves are an example of a grey area. A small minority of interviewees (3) indicated that they include such assets in their classification of infrastructural assets. One interviewee stated that this is because they are non-saleable, they are continually maintained and they will always be there for the public: "they're just like the roads and the sewerage system". Furthermore, he contended, this classification was in line with other councils, and was, "more or less, generally accepted accounting practice".

2.2 Valuation of Infrastructural Assets

The majority of the surveyed entities use the depreciated replacement cost (DRC) basis of valuation for their infrastructural assets (see Chapter 8). For pipeline assets, however,

four interviewees pointed out that a difficulty encountered in this method of valuation is that, given the present state of knowledge, a straight line decline in service potential in the asset is assumed. Yet in practice, the assets provide a constant level of service capacity right up to the end of their useful lives and many pipelines last well beyond their original anticipated useful lives. Therefore, based on the information currently available, valuations of pipeline infrastructural assets are very limited. For instance, two interviewees indicated that the estimated useful lives used in the initial valuations of infrastructural assets were basically guesses. One of them stated; “the useful life of the assets is estimated on the gut feeling of the people who work with the assets”, while the other stated that valuing infrastructural assets is an art form rather than a science.

Similarly, another two interviewees pointed out that when their infrastructural assets were first valued, the process was very much an artificial one because of the lack of information on their pipeline assets. Valuation on a DRC basis involved using what available asset information they had, applying replacement costs, and then assessing how far down the length of useful life the different assets were, but:

... this tended to be a somewhat artificial process because it wasn't related to the actual condition ratings [of the assets]. It was also somewhat conservative in that it decided things were probably more worn out than they actually are. For instance, they [the engineers] had to decide on arbitrary useful lives, in the sense that if a type of pipe could be expected to last fifty years, and it had been in the ground for forty years, then its value was only one fifth, being the remainder, of that useful life. In fact, a lot of these pipes, although they are at the end of this arbitrary useful life, are still working perfectly satisfactory and there is no plan to renew them.

Despite the above limitations, four interviewees indicated that the completion of the collection of information on pipeline infrastructural assets and assessing their conditions will enable more reliable valuations.

2.3 Information on and AMPs for Managing Infrastructural Assets

Interviewees discussed several aspects relating to the information required to manage and account for infrastructural assets, including the stage of development of AMPs for local government in general, the collection of information on pipeline assets, difficulties in determining annual maintenance requirements, and various issues involved in the development of AMPs.

Two interviewees pointed out that the drive for better asset management within New Zealand local government is an outcome of the local government reforms in 1989. Accordingly, accountability and transparency became very important concepts and underpin recent developments in this area. In regard to the stage of development of AMPs, one engineer stated:

They're coming on stream and there's a lot of work being done coordinating things nationally. . . . But the problem is that every council has got to collect all that information itself and get people to do research on all sorts of things, like their conditions, and that's going to take time. So there's a lot of gut feeling asset management going on.

He pointed out that local authorities are, in many ways, still responding to the requirements of the reforms. But once the initial stage of collecting information, implementing the PAMS (Pipeline Asset Management System) system and developing AMPs is completed, then local authorities will have better information, enabling improved decision making. Similarly, another interviewee argued that it is important to realise that New Zealand local government is still in an evolutionary phase.

Despite the common view among the interviewees that the information on roading infrastructural assets is generally good, it was thought that information for pipeline assets, particularly on condition, is generally inadequate. Three interviewees indicated that much work is being done on a nation-wide basis to coordinate the development of PAMS. Although councils have a lot of data in manual form, additional information is being entered into information systems such as PAMS, on, for example, location, age and condition of pipeline assets. Ten interviewees indicated that this information is also being integrated with Geographic Information Systems (GIS). These are spatial systems which are used to document all sorts of information about the assets and also show their geographic location using topographical aerial views of the city on a computerised basis. Additionally, two interviewees indicated that they were attempting to link GIS with PAMS, and interviewees from one council noted that they use a Global Positioning System (GPS) to establish the existence and location of pipeline assets.¹ The work involved in collecting information and implementing asset management information systems needs to precede the development of fully comprehensive AMPs and is expected to take several years to complete.

¹ They noted that the GPS works on the basis of navigation via satellite positioning to determine the whereabouts of underground pipelines out in the field.

2.3.1 Difficulties in Determining Annual Maintenance Requirements for Pipelines

A number of difficulties in determining annual maintenance requirements on infrastructural assets were identified, including: rapid growth and development in infrastructural assets; different rates in the deterioration of materials (some materials have lasted well beyond their expected life, while others have needed replacement well before the end of their original expected useful lives); the impact of different soil conditions; and problems in assessing the condition of infrastructural assets. Furthermore, there may be difficulties in the long-term planning of maintenance requirements beyond 10 years or more. For example, some of the difficulties involved in working out how much maintenance is required on pipeline infrastructural assets are illustrated in the following engineer's statement:

We've got old cast iron pipes that are eighty years old plus and they're in better condition than some of the new pipes that are only 25 or 30 years old. But what is a reasonable average life of a pipe in Manukau? We could put three people in a room who'd all be pretty confident and would come out with three different right answers, on the basis of the information that we have. So we've said, 'let's take fifty years. So we'll just have to say that we should be rehabilitating at a rate of 2 per cent per year'. And we're not rehabilitating, on a programme basis, for sewerage or stormwater, any at all. We're doing none. We're only doing ambulance work. In other words, if a part fails, then we fix it. . . . Rather than saying 'Well the condition of this line is now shaky. Its failed in four places in the last three years (or whatever the time frame) and it would now be a sensible thing to do, to preserve the integrity of the system, the reliability, the side effects' . . .

As indicated above, and by a few other interviewees, there is a desire to move from performing maintenance on an 'ambulance' basis to planning ahead and determining requirements based on condition assessments of infrastructural assets. One interviewee indicated that most councils calculate and fund their maintenance on pipeline infrastructural assets on a historic basis, in terms of what it costs and how many breaks there are in the pipes each year, rather than on a logical, rational or formal assessment. Another interviewee pointed out that what they are attempting to do is to be able to plan for maintenance requirements and replace pipes before, rather than the day after, they break. However, to plan ahead in this manner requires information about the condition of the assets.

One interviewee indicated that condition rating of pipes is in its relative infancy in New Zealand. Engineers can put television cameras down the pipes and see how many cracks there are in the pipes but they still have not worked out a method of expressing what this means:

It's a matter of developing sufficiently sophisticated approaches to interpret what the technology shows them. Because the engineers . . . can't determine whether that pipe is likely to collapse. They can't determine the age of the cracks. The cracks may have occurred in the first five years after the pipes were laid as the ground around them settled, and those cracks might have been there since then for 45 years. So, who knows? They may be quite satisfactory as long as nobody drives a bulldozer closely above them. Or, so long as tree roots don't get in, they may be satisfactory for another 45 years. And this is the sort of difficulty they have. They can do flow tests . . . [and] can look for problems like tree roots, or cracks, where they can actually see water coming in. But beyond that, determining condition ratings is actually an obstacle to getting really accurate numbers.

Three engineers suggested that perhaps the only way that an idea of the condition can be gained is by measuring the number of failures in the system, as a proxy for, or an indicator of, the need for replacement. Additionally, one interviewee argued that, even if condition could be determined reliably, it is too costly to put television cameras down every pipe to determine their condition. Statistical sampling methods are used instead, as indicated by four interviewees. From the statistical sample, the information is extrapolated to estimate the condition of the whole network.

There may also be difficulties in determining annual maintenance requirements for pipeline infrastructural assets over the long term. One interviewee pointed to the following difficulties in determining a long range normative charge:²

The literature on it says that you should look forward as far as you need too to get one whole cycle of replacement. Now that sounds reasonable but it's in fact almost impossible to value because assets in this industry typically can last sixty, eighty, a hundred years. And I defy anyone to model that far ahead! We try modelling twenty years ahead but typically I don't have a lot of confidence in the second ten years. I think the engineers have great trouble foreseeing and projecting projects beyond the first ten years. So you can only do it at the conceptual basis, or looking at one particular asset so you can say 'Well this dam or this new treatment plant or this particular pipeline'. If you start looking at your total system, it's dreamland to go that far into the future.

Another interviewee also expressed lack of confidence in the second ten years of a twenty year financial model for infrastructural assets, stating that they are really "mirror imaging" the first ten years.

2.3.2 Asset Management Plans

Interviewees identified a number of issues concerning AMPs, which are discussed below under the following topics: the importance of managing infrastructural assets and the need

² See Chapter 3, p. 41. Determining a Long Range Normative Charge involves forecasting maintenance requirements over the long term and then smoothing fluctuations to get an annual provision which is then expensed each year.

for AMPs; the use of AMPs as a rationale for spending on infrastructural assets; AMPs as a long term management tool; the benefits of a multi-disciplined approach to managing infrastructural assets; incorporating growth and inflation in AMPs; and issues concerning levels of service.

Nearly half of the interviewees (8) explicitly stated that the most important issue with regard to infrastructural assets is how they are managed. Furthermore, AMPs are essential for this purpose, regardless of the accounting method adopted. Therefore, as one interviewee stated, although there has been a lot of progress made, there still needs to be a continual drive by local authorities towards completing their AMPs.

Three interviewees indicated that AMPs are expected to be a useful management tool for long term planning for infrastructural assets and for generating more accurate numbers for the strategic plans of the Council. AMPs enable a strategy to be developed which shows the issues facing the entity in the medium-to long-term and how the assets are to be managed and maintained. Therefore,

... over a 20 year period [the] Council can look more closely at how it's going to finance that 20 year period, where the peaks and troughs will be, and how it will manage the relationship between different periods.

Three interviewees pointed out that AMPs provide a justification or rationale for the level of spending on infrastructural assets. For instance, one interviewee stated that his Council had agreed to adopt a long term programme of asset management and rehabilitation for their pipeline assets. This was because the AMP had shown the councillors that it is worth spending money on assets that are not easily seen.

A third of the interviewees (6) noted the benefits of pursuing a multi-disciplined management approach to the development of AMPs. For example, they indicated that both financial and strategic planning people are working together with infrastructural asset managers and engineers to develop AMPs. Moreover, interviewees from two city councils stated that they had set up special steering committees to coordinate the various management disciplines involved in the development of AMPs.

Allowing for future growth in infrastructural assets was raised by one engineer. He argued that growth is a part of managing the infrastructural asset and a funding

mechanism ought to take this into account, but conventional wisdom does not support including expected growth in AMPs. Growth is supposed to be accounted for by the increased maintenance that is required in future years and a growth development plan is separate from an AMP, but:

The people I talk to in this organisation, in parks and water services, and the rest, have said, 'That's bloody rubbish! It doesn't make any sense!' It doesn't make any sense to me either Because if you're going to deal with your assets then let's deal with the assets! Now let's deal with them completely! And let's model what we're going to be doing in the future. And that includes building new things because areas are growing. . .

Hence, there appears to be a reasonable argument for including expected growth in the AMP.

Another aspect which might be incorporated into AMPs is inflation, as indicated by one interviewee. He argued that it was appealing for his entity to have everything in constant dollar terms, otherwise the tax cashflow is impossible to determine.

Five interviewees stated that it is the level of service expected of infrastructural assets which drives the amount of expenditure required to maintain the system. Infrastructural assets can be maintained at different levels of service, all of which maintain the assets indefinitely. However, costs increase with higher levels of service. Indeed, four interviewees pointed out that the standard of service for infrastructural assets required and expected by the public is increasing. For instance, one interviewee stated that the public expectation of the standard of roads, compared with ten years ago, has increased and that tolerance for potholes in roads is now very low. Similarly, three interviewees indicated that the levels of service expected of sewerage and drainage systems has risen in recent years due to the rise in environmental standards (particularly the impact of provisions in the Resource Management Act 1991). For example, in Auckland the separation of sewer and drainage pipes is being accelerated because it is no longer acceptable for sewerage overflows to go into the Manukau Harbour. One interviewee exclaimed:

But it's just with the general movement of society towards a greener, cleaner, standard. It's becoming less acceptable, even if in fact the actual diluted sewerage is not causing any problem. It's just unacceptable that it goes out there, notwithstanding whether it actually causes a problem.

In determining the levels of service, seven interviewees stated that their council would develop these in consultation with the public. During the consultative process, several

scenarios would be presented with expected costs shown for each. Representatives of the public could then decide on the desired and most appropriate levels of service.

Customer focus groups were identified as a vehicle for consulting with the public with respect to determining levels of service. Four interviewees indicated that their respective councils would use such groups. Only the Christchurch City Council had actually used customer focus groups; they have been used in the preparation of its roading AMP. The engineer interviewed from this council was surprised at some of the results of this process. People seemed to disagree with some of the engineers' beliefs about what customers think in regard to roading. Furthermore:

... the key issue for me isn't the technical development of asset management plans. It's the level of service issues. The fact that we have never asked our customers what they want. We've always just given them what we think they should have. And if we can get into the mentality of asking our customers what they want, and then telling them what it costs to have that, and saying 'Well is that what you want to do?', that's a good way of approaching things.

2.4 Increases in Expenditure Expected and Intergenerational Equity

It was widely expected among the interviewees (14) that there is a need for increased spending on infrastructural assets because:

- More maintenance and renewal expenditure is needed as the assets move further into their replacement cycle, particularly in cities with rapid growth and development in the last 20-30 years;
- Rapid growth in some regions will require upgrades and increases in the capacity of services; and
- Rising environmental expectations require an upgrade of facilities to meet new standards, especially for sewerage and stormwater infrastructural assets.

Renewal and maintenance costs are expected to increase over the next 10-15 years in the Auckland region, as a result of rapid growth in last 20-30 years. In addition, increased expenditure to meet the region's needs is anticipated due to upgrading and increasing the capacity of infrastructural assets, particularly with regard to the upgrade of the Mangere Treatment Plant. Two interviewees indicated that the wastewater services in the Auckland region have been consistently underpriced in the past and that there is now a need to increase charges, perhaps by up to 50 per cent in rates (as indicated by one interviewee),

over the next few years. They both noted that this is the result of a failure to keep up with rising environmental expectations and recent legislation, such as the Resource Management Act 1991. That is, the standard required of sewerage and wastewater services has increased but facilities have not been upgraded to meet these new standards.

Despite recognising the need for increased expenditure on infrastructural assets, more information on infrastructural assets is needed. Five interviewees indicated that they could not increase charges and, therefore, the level of rates, until more information about the condition of infrastructural assets is known and formal asset information systems are implemented. For instance, one interviewee pointed out:

It's very hard in the absence of a formal system to be able to back up. I mean, I can sit here and say, 'Well, the average life is fifty years', and somebody else will say, 'Naa, its too much'. Nobody can actually demonstrate [this properly] and just about every city in New Zealand is in the same boat.

Expenditure on infrastructural assets of the nature above will have a significant bearing on intergenerational equity, with respect to the burden of the costs and debt to be borne by current and future generations. As expressed by one interviewee:

... there is no doubt that we need to be putting more into the system, if we need the system to perform in the long term and not, say, leave it for your or my kids to pick up the shambles because of our neglect. So there's a hereditary problem here if you like because you inherit what your forefathers left behind. Now, socially, that's not a particularly responsible way to go.

Around half of the interviewees (8) thought that intergenerational equity is achieved where the current generation is paying for the services of infrastructural assets each year, that is, paying for the cost of annual depreciation (under traditional depreciation) or renewal and replacement costs (under renewal accounting).

The issue of intergenerational equity was discussed by the majority of interviewees (11) in terms of how it relates to the funding of large replacements or new projects, such as the construction of a new building or upgrading a sewerage treatment plant. Only one interviewee discussed intergenerational equity more specifically. He argued that where a council has borrowed to construct the assets, is paying off the debt and is also fully maintaining the assets, then the current generation is paying too much, and, "I think there's a good argument that says that you [the current generation of ratepayers] don't pay the debt".

Two ways of funding the cost of large replacements of infrastructural assets were identified by the interviewees:

- (1) charging users of infrastructural services for the cost of the replacement before the need arises, thereby obtaining the funding in the years prior to actual replacement; or
- (2) raising loans for the total cost of the replacement and spreading the repayments over a period of 25-30 years after the replacement, thereby spreading the costs over a number of years after actual replacement via long-term debt.

2.5 GAAP for Infrastructural Assets and Renewal Accounting

In the literature review it was noted that there is a lack of generally accepted accounting practice (GAAP) and that there is diversity in the accounting practices of New Zealand local authorities for infrastructural assets. In Chapter 8, diversity in the accounting practices among the 12 surveyed local authorities was also identified. Interviewees discussed a range of issues concerning GAAP for infrastructural assets and the use of renewal accounting. These include: the need for GAAP; that renewal accounting is expected to become GAAP and has in fact now become GAAP within New Zealand local government; and that because of this, it puts pressure on the NZSA to recognise it in its forthcoming revised financial reporting standard (FRS) on fixed assets and depreciation. Furthermore, several interviewees acknowledged that the Audit Office supports the use of renewal accounting for infrastructural assets.

Interviewees from all of the 12 surveyed local authorities acknowledged that renewal accounting is not GAAP (in terms of being recognised by the NZSA's accounting standards for fixed assets and depreciation (SSAP 28 and SSAP 3)), and that there is a need for an accepted accounting practice, not only for renewal accounting, but also for infrastructural assets anyway. One interviewee asserted that a national approach was needed which would stand up theoretically as an appropriate accounting method for infrastructural assets, while also having the sanction of the NZSA. In addition, two interviewees indicated that their councils would follow whatever the NZSA deems to be an appropriate accounting method for infrastructural assets.

A moderate number of interviewees (7) anticipated that renewal accounting would eventually become GAAP for infrastructural assets in New Zealand local government. Two of them expected that the method would be refined over the next few years rather than abandoned altogether. One interviewee expected that if AMPs could generate reliable information on the amount of physical deterioration in the system, then renewal accounting would probably replace traditional depreciation.³ Four interviewees argued that, while AMPs are being developed, there needs to be scope or leeway to allow interim approaches. For example, Christchurch City Council has adopted an interim approach of fully depreciating its infrastructural assets until all of their AMPs are fully developed and adopted. It then anticipates adopting renewal accounting for the 1997/98 financial year.⁴

Six interviewees argued that renewal accounting has now become generally accepted practice within New Zealand local government. For instance, one interviewee indicated that the SOLGM (1994a) guidelines were developed with the NZSA's revision of SSAP 28 and SSAP 3 in mind, in order to generate GAAP. He asserted that the guidelines have achieved this and that, in many ways, they are the interpretation of SSAP 28 and SSAP 3, that accounting for infrastructural assets had been the topic of four or five seminars held by the SOLGM, and that feedback from these suggests that renewal accounting concepts are generally accepted. In addition, four interviewees indicated that they do or will follow the SOLGM (1994a) guidelines for their infrastructural assets.

Renewal accounting is becoming more widely adopted among local authorities, and even by public utility and power companies, because they are looking for better ways of accounting for their infrastructural assets. One interviewee suggested that this puts pressure on the NZSA to sanction renewal accounting in its revised FRS:

... we believe that the general thrust and push of people that are actually out in the field doing it, we believe that the pressure we're putting on the Society of Accountants will really force them to come out with an appropriate standard in due course.

³ This point was also made during contact with a senior local government auditor from Audit New Zealand, Christchurch. It was suggested that traditional depreciation is probably the status quo approach with respect to accounting for infrastructural assets and that many local authorities are likely to switch to renewal accounting once they have fully developed AMPs for all of their infrastructural assets.

⁴ Source: Engineering manager interviewed from Christchurch City Council.

Another interviewee went even further, claiming that renewal accounting has in fact been publicly endorsed as GAAP by the NZSA:

... well, it's darn nearly a year ago. It was November last year, at a meeting of the Society of Local Government Managers, that the Audit Office and the Accountants Society said that they now accept that renewal accounting is GAAP and all it needs, really, is the formalities of new SSAPs [Statements of Standard Accounting Practice]⁵ to express it.

Three interviewees pointed to the Audit Office's preference for renewal accounting in contrast to traditional depreciation. One interviewee suggested that, although the Audit Office would not object if his Council were to depreciate its assets in the normal way, it would recommend a maintenance in perpetuity approach with AMPs because it is a better management technique and because the most important issue concerning infrastructural assets is their proper management.

In summary, it appears that renewal accounting is gaining the status of GAAP within New Zealand local government. This should be putting pressure on the NZSA to recognise renewal accounting in its revised FRS on fixed assets and depreciation.

2.6 Depreciation Funds Used for Capital Expenditure – Similar to Renewal Accounting?

Two surveyed entities used an alternative depreciation accounting approach (see Chapter 8, p. 144). They earmark funds generated from depreciation and apply them to their capital expenditure programmes for the renewal and replacement of infrastructural assets.

Interviewees from both of these entities believed that the annual depreciation expense under traditional depreciation ought to be matching the amount of renewal and replacements anyway. For instance, Wellington City Council's accounting policies state:

Depreciation is expensed in the operating statement and is calculated as the reduction in potential service delivery which would have occurred during the year if no planned maintenance had taken place (1994, p. 65).

The interviewee's explanation of the above policy was as follows:

What it's basically saying is that if we did absolutely nothing during the whole year the value of our infrastructure would go down by one year of its useful life. So what we've done is actually made an assessment of all the component parts, in terms of how long they're going to last, then worked out what sort of stage they're in their life cycle, and then we've made an assessment that, "Well if we did nothing in this year, how much

⁵ Note that accounting standards promulgated by the NZSA are now termed 'financial reporting standards'.

would those assets actually devalue by?" And that's equivalent to what we call depreciation.

Furthermore, he did not see any significant difference between the depreciation approach which they had adopted and renewal accounting:

All we're doing is effectively charging the full depreciation through and then treating a lot of the expenditure (which maybe classified as maintenance) as capital, because it offsets that depreciation. So I think the results are actually the same.

In other words, under this alternative form of depreciation accounting, capital expenditure offsets the amount of depreciation in the overall network and is similar to renewal accounting in this respect.

3. Requirements of Renewal Accounting

Interviewees' views concerning four of the main requirements of renewal accounting (listed as issues (6) to (9) in Chapter 7 on p. 117) are discussed below under the following topics: (1) the assumption of an indefinite useful life; (2) the distinction between revenue and capital expenditure; (3) provisions for deferred maintenance; and (4) the assumption of a steady state and factors which affect reliable measurements of losses in service potential.

3.1 *Indefinite Useful Life*

Five interviewees shared a view which can be summarised by the following quote from one of them, that the indefinite useful life of an infrastructural asset means:

... that for whatever level of service you've determined, you can provide that level of service permanently, with maybe ups and downs, but over an average you're permanently providing that level and you're achieving that by constant refurbishment or redevelopment or reconstruction of the asset.

Infrastructural assets are continually maintained and are required to provide their services permanently because, as one interviewee argued:

... we're always going to need roads forevermore, people are always going to want water to come to their houses and people are always going to want wastewater to go away, and it's always going to rain, so there'll always be a requirement for stormwater drains forevermore (OK, there may be some technology that might change at some time in the future and people don't need water but it's hard to imagine that would happen). So what we're saying is that man has always needed these things and always will, forevermore.

One interviewee explained that infrastructural assets need continual maintenance because it is impractical to replace the whole system at once, first, because it would not be

financially viable, and, second, because an ongoing service must be provided. It would not be possible to shut down the town for two or three months while the new system is being installed. Consequently, one interviewee stated:

At no stage do you actually throw them [the infrastructural assets] out and start again. You're keeping them going and replacing parts of the whole but never the whole of the asset at a particular time and, as a result, the asset is continually maintained.

Similarly,

You have the strategy where there's heaps of different components in the network and your overall integrity of the network must be preserved. But at any one time there are pieces of it that are older than half of a life and pieces that are younger and so on, and you're continually turning them over. So bits of the network are being refurbished as you go along . . . but the total impact on the system is that it stays stable.

However, the life of the network is deemed to be indefinite only until a decision is made otherwise, as indicated by two interviewees, for example:

The term 'indefinite life' is . . . not so much saying that 'These drains have an indefinite life', but that, in the foreseeable future while they are required for the needs of the city. . . until you have changes of need or changes in technology, then you regard these infrastructural assets as regarding maintenance indefinitely.

Furthermore, it is not the individual components of the network which have an indefinite life (an assumption which is "usually incorrect and misleading"), but, "it's the network itself which has got the indefinite life". The useful life of individual infrastructural assets "just may be somewhat difficult to determine".

3.2 Revenue vs Capital Expenditure

Interviewees discussed a number of aspects related to both revenue and capital expenditure, including the need for a clear distinction, proportional allocation of expenditure to capital, and that roads will need major reconstruction and replacement expenditure at some stage.

The need for rigorous and consistent definitions was expressed by four interviewees, describing the distinction between what is renewal and what is capital expenditure as

sometimes “blurry” or “messy”.⁶ For instance, one interviewee stated, “we could be a bit tighter on our guidelines and policies”, and another interviewee, discussing whether a pump replacement should be treated as a capital improvement or an operational cost, stated:

We’ve never quite put that one to bed and if I was to be honest, I would say that both approaches happen simultaneously within this Council. So there’s a little bit of unfinished business there as to how you deal with things.

The broad test which is applied in determining whether expenditure is revenue or capital is, as one interviewee stated:

If we are adding to the performance or the capacity of the system, then that’s capital improvements. If we are simply maintaining the system in its present capacity, that that is operational cost.

In addition, one interviewee pointed out that it is always a bit “murky” as to whether or not expenditure which restores the level of the asset value on the balance sheet to where it should be, should be capitalised. Citing the case of maintaining the roading network in his council, they had realised that they had had a longer resealing cycle in comparison with three other councils in the region. By having a longer period between reseals, it had noticed that there was an increase in their deterioration and that more work was needed. Hence, in comparison with the other councils, it had identified a backlog of maintenance to bring the roads up to the standard required where they would be maintained in the most efficient and sustainable way. To eliminate this backlog, expenditure which reduced the backlog had been capitalised over a period of five years by the council.

Five of the nine entities using renewal accounting allocate proportionally to capital expenditure the increase in service capacity where expenditure both renews and replaces an asset (see Chapter 8). Conversely, Auckland City does not use proportional allocation. The interviewees from Auckland City argued that with large network assets, a huge overhead would be involved in trying to capture as capital all the little increases in the network’s service capacity. Instead, they expense the entire amount of the expenditure on

⁶ A clear distinction between capital expenditure and revenue expenditure is equally important under traditional depreciation as it is for renewal accounting. To avoid double counting under traditional depreciation, one interviewee argued that this can be overcome by adopting a rigorous definition of what is capital and what is revenue expenditure. In his entity, old assets being replaced and their upgrades are not both depreciated and expensed at the same time. Therefore, renewals are not expensed and also capitalised and double counting is avoided. Similarly, the Christchurch City Council states that double counting is avoided in the operating account by keeping separate capital expenditure (which includes expenditure on renewals and replacements) and charging it to the capital account (Christchurch City Council 1994/95 Annual Plan, 1994b, p. 8).

replacement. Most of the cost of replacing, say a water pipe, is in the actual digging up and reinstatement of the pipe and not in the cost of the new pipes. The actual cost of any increase in the size of the pipes is only a small proportion of the total cost and not significant enough to warrant keeping separate accounting records (which charge the proportional increase in service capacity as capital expenditure). Therefore, with large infrastructural networks, proportional allocation may not be warranted since:

... from the practical point of view, trying to separate your cost into capital and renewal under a circumstance like that is just not worth the cost and hassle of doing it.

However, none of the other interviewees from the five entities which use proportional allocation mentioned the above difficulties. Indeed, one interviewee stated that, although the practice was initially a bit hard for the politicians, and also the team of engineers doing the work, to understand (since there were two cost figures in the annual plan, one for the maintenance part of the expenditure and the other for the capital part), they had become accustomed to the method.

Three engineers discussed the process of continually maintaining roads and the maintenance, resurfacing and replacement expenditure required. Even with periodic maintenance, at some point, roads need major reconstruction work. Each of the engineers described the life and maintenance cycle for a typical road surface (identical to Figure 2.1 in Chapter 2, see p. 32). One of the engineers pointed out that by continually maintaining and resealing the road when it gets to its critical point, its service life is significantly extended. However, all three engineers stated that the road surface's service potential does not quite get back to brand new or one hundred percent condition. Even with periodic resealing and treatments to the surface of the road, sooner or later there is a point in the road's life cycle where a full replacement is needed because, "eventually, even with the best intentions, the condition's gradually falling off". Major reconstruction is required because:

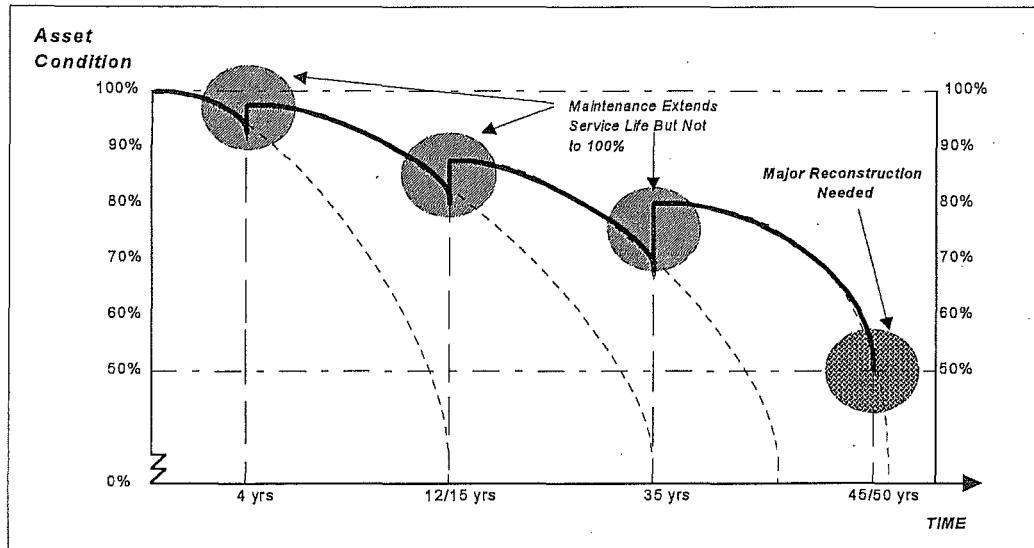
It gets to the point where the level of service is so low, it gets so expensive to keep potholing and all the other dig outs all over the place, that you've really got to go back and spend dollars ... the proportion of your operational costs that you're using in any one year on that particular piece of road is climbing out of proportion. It's more than general maintenance, its become ... 'severe maintenance' ... so then you're in for a major rehabilitation and maybe it's a combination of reconstruction and lime stabilisation, and a whole lot of other techniques, to actually get it back up to being as good as a new road again.

Yet, this involves more than just treatment to the surface of the road:

... you dig up the whole road and you recalculate what the roading requirements are. ... and you go back and you rebuild the road and start a new one again ... put new roading metal in, the whole thing.

Figure 9.1 below depicts an example of the life cycle and maintenance/deterioration of a road and the point where major reconstruction is needed.

Figure 9.1: Life Cycle and Maintenance/Deterioration Relationship for Roads⁷



Hence, even with continual maintenance and periodic treatments to the surface of a road, there is not necessarily a smooth pattern of expenditure. At some point in time major reconstruction of the road is needed, virtually building a new road. However, there was a difference in opinion between two of the engineers concerning the appropriate accounting treatment of major reconstruction expenditure on roads. One engineer suggested that it should be capitalised, but the other stated that it should be expensed as an operational cost because it is incurred as part of maintaining the network.

3.3 Provisions for Deferred Maintenance

One criticism in the literature is that deferred maintenance forms of renewal accounting give undue scope for manipulation and regulation of accounting profits. Several interviewees made comments on this.

⁷ Source: Road Planning and Asset Manager interviewee. (Note: the other two engineers also drew similar diagrams). In addition, this roading engineer pointed out that the life cycle of a road and the maintenance required on it depends upon a variety of factors, including the amount of loadings (traffic) on the road, type of materials used and pavement structure. For busy roads, the road might last for 50 years with continual maintenance before its structure needs work, whereas, for a normal local road this period might be up to 90 years.

Three interviewees argued that AMPs would be audited, ensuring that annual maintenance figures are not manipulated from year to year. The annual amount of maintenance required on infrastructural assets would be derived from the AMP. Two of them pointed out that if a council wanted to save money by “fiddling” with its AMP, the AMP itself would make such fiddling transparent to any auditor or other interested party; “... the reasons for change will be well documented”. However, one interviewee suggested that, even if AMPs are audited, auditors will not be in a position to judge their merits because the professional disciplines involved in their development are outside the scope of their knowledge. The auditors would only be able to assess whether or not the AMP covers everything that it is supposed to do, so there will still need to be a reliance on the integrity of the professional people within the organisation.

Three interviewees pointed out that the actual funding of required annual maintenance is a totally separate decision from the calculation of it. The amount of maintenance required is charged as an annual provision and when actual maintenance is carried out the provision is reduced. But the decision about how much maintenance to fund is a decision made by councillors and not by the managers of the organisation:

... we would tell the politicians what the annual amount is and we would recommend the levels of expenditure. But at the end of the day, it's up to the councillors not us.

Therefore, the annual amount of maintenance will be a given figure from the AMP and, where deferred, this will be reflected in the balance sheet through the provision for deferred maintenance.

In some cases it may be a justifiable decision to defer annual maintenance required on infrastructural assets. One interviewee suggested that the annual renewals figure should not be constant because infrastructural projects are lumpy by nature. Therefore, it may be appropriate to defer some maintenance, in which case this would still be recognised through provisions for deferred maintenance. For example, maintenance may be deferred because there is a period of high inflation and a shortage of contractors; the entity opting to defer work on infrastructural assets for a year until the economy settles down so that it can get better value for money. Furthermore, another interviewee also argued that, while this deferred maintenance cannot be allowed to build up, it does not necessarily mean that there is a backlog of expenditure which is causing a deterioration in the assets, and,

... I think you've got to look at the scale of things, where you might be talking about deferred maintenance of \$10m in an asset that could be worth \$800m.

Therefore, it may be justifiable to defer maintenance in some cases, in which case the allowable scope for deferral needs to be considered.

3.4 Steady State, Lumpiness and Obsolescence

Interviewees discussed a number of issues in relation to the assumption of a steady state and measuring loss of service potential, including: difficulties in determining annual maintenance expenses, ways to deal with the problem of lumpiness of expenditure patterns, and various forms of obsolescence which are associated with infrastructural assets.

3.4.1 Steady State

Interviewees from the larger and more established cities, such as Auckland and Christchurch, indicated that they were well into the cycle of renewal of their assets. Because these cities have large infrastructural networks, developed over a long period of time, the need for renewal and replacement expenditure on these assets is relatively constant. For example, an engineer from Christchurch City Council indicated that their roading network is basically being maintained at its existing size. The roading network is approximately 1580 kilometres (km) long but additions to the network, through new subdivisions being built, amount only to around 5km per year. He noted that Christchurch has a wide range of asset ages, and, therefore, the renewal and replacement expenditure needed to maintain the assets is reasonably constant.

In contrast, newer cities, which have had large periods of growth, do not appear to be in a steady state. For instance, interviewees from the Manukau, North Shore, Waitakere, and Hamilton city councils stated that they had had large periods of growth in their networks in the last 20-30 years. An interviewee from one of these councils indicated that, because of periods of huge growth, annual expenditure required on his City's infrastructural networks may not be consistent and he was unsure about whether or not they are in a steady state.

Because of such rapid growth, the problem of lumpiness of expenditure patterns on infrastructural assets arises since much of the network is relatively new, requiring little

renewal and replacement in the early years of its life (i.e. the renewals holiday). Interviewees identified three potential ways to address this problem. First, seven interviewees indicated that, in practice, the amount of annual maintenance required on infrastructural assets would probably be smoothed, mainly because of the impact of large fluctuations on general rates.

Second, six interviewees indicated that some sort of annual charge would probably be needed during the renewals holiday. Charging an expense during the years prior to actual replacement would retain sufficient funds to renew and replace the assets, avoiding lumpiness in expenditure patterns when actual replacement occurs. However, only Waimakariri District Council (WDC) appeared to have recognised the need for an expense during the renewals holiday in practice (as noted in Chapter 8). WDC depreciates its new pipeline and roading infrastructural assets down to 50 per cent of their value. For instance, pipes are depreciated at 2 per cent per annum for 25 years based on an assumption of a 50 year life. When the assets have been depreciated down to 50 per cent of their value, then expenditure on renewal and replacement will replace the annual depreciation charge. One of the interviewees stated that this, in theory, is assuming that at a fairly conservative estimate, if basic maintenance is not carried out the system should last for 50 years. The WDC interviewees believe this initial depreciation allows for a more even pattern of expenditure on the assets so that large increases in rates will not be necessary when actual replacement and renewal is needed.

Third, one interviewee suggested that it may be better to account for very large components within networks separately, because of the potential for lumpiness of expenditure and their effect on reported expenses when replaced.

3.4.2 Obsolescence

Two interviewees discussed three forms of obsolescence associated with infrastructural assets, including, technical, social and situational obsolescence.

One interviewee gave the following examples to illustrate two forms of obsolescence. First, technical obsolescence occurs in street lighting. About 90 per cent of their street lighting network comprises 30-40 year old lamps. The light output of the new streetlights is about four times greater, although the costs of replacement are very high (around \$6m to

change 32 000 light bulbs). Second, social obsolescence occurs in dish channels in the roading network. Both customers and politicians hate the old deep dish curve channels and want to get rid of them. In addition, replacing dish channels with newer channelling provides an extremely rare opportunity for “environmental improvement”:

So we can go into these old, big, wide, ugly streets and we can come back and narrow the carriage way, put street trees in, features either end—wow! What a great job! And customers say ‘Yeah, that’s great, keep on doing that, we love that!’ and the politicians say ‘Yeah, that’s great, do that, we love that!’—And it costs us millions of dollars a year. And it’s not been done for the asset! It’s been done for improvement. We could replace that asset and maintain that asset. No problems at all. But in fact, dish channels, if you like, are ‘socially obsolete’, rather than technically obsolete.

The dish channels are being replaced prior to the end of their envisaged economic life, affecting the amount of expense which would be charged under renewal accounting. However, this so-called “environmental improvement” gives rise to capital expenditure.

The second interviewee provided an example of what he called “situational obsolescence”, where what was originally a residential area, became an industrial area and therefore the sewer pipes had to be replaced to allow for the increased capacity due to industrial use, even though there was nothing technically wrong with the pipes. He suggested that renewal accounting does not deal with this type of obsolescence very well.

4. Considerations Relevant to Using Renewal Accounting

Interviewees identified and discussed a number of considerations which are relevant to using renewal accounting, including:

- conceptual merit/logic of accounting method;
- transparency;
- reliability;
- management support;
- practicality;
- costs of information;
- understandability; and
- funding implications.

The above considerations have a bearing on the usefulness of information for both financial reporting and internal management purposes and are discussed below.

4.1 Conceptual Merit/Logic of Accounting Method

Seven interviewees argued that renewal accounting is more appropriate than traditional depreciation because it recognises the need for continual maintenance on infrastructural assets which provide an ongoing service. For instance, one interviewee argued:

By expensing maintenance and replacement items, . . . [renewal accounting] reflects the fact that it is an ongoing service, not just an asset which has got a defined life and then you throw it away and bring in something else.

Moreover, another interviewee, explaining why his council uses renewal accounting for its roading infrastructural assets, said:

The whole philosophy of roading is geared towards continuous maintenance of a certain standard, which, in many ways, I think is defined by their industry, by the engineers themselves and by Transit⁸ and so forth. So, they were really doing continuous maintenance anyway.

In contrast, traditional depreciation writes off the total cost of the asset over its useful life, until, as one interviewee stated, "either it doesn't exist any more or it's not worth anything". Five interviewees argued that this is illogical when infrastructural assets are required to be maintained in perpetuity. For instance, one interviewee stated:

The reality is . . . the depreciation argument is nonsense! Why do you apply depreciation to an asset when you're maintaining in perpetuity? What the hell is depreciation?

Another interviewee suggested that because of the continual maintenance required on infrastructural assets, they "are never going to have a nil value and are never going to cease to exist", to which his colleague added, "they mustn't have a nil value. They have to be kept running and operating. . . at a reasonably constant level of service".

Four interviewees doubted whether traditional depreciation, as an allocation of cost, reflects the actual condition of infrastructural assets. For example, one interviewee argued:

. . . depreciation based on value just doesn't mean anything. And you've sort of worked it out on average life of components. For instance, you'd have a very high depreciation cost there which doesn't really match what's happening on the ground.

⁸ Transit New Zealand (see Chapter 4, p. 68, Footnote 22).

Or, as another interviewee suggested:

... we're telling the engineer that his road's depreciated by 10 per cent. He looks at the road, he knows it hasn't. So what we're telling him is a lie!

Therefore, for these interviewees, renewal accounting is preferable to traditional depreciation because it reflects the condition of infrastructural assets more reliably.

4.2 Transparency

Transparency was regarded by six interviewees as one of the key advantages of renewal accounting, as illustrated in the following statement by one of them:

One of the problems in the past is when councils have come in, and for political reasons, want to look good and hold the rates down and allow the assets to deteriorate. But it's not obvious for years. Infrastructural assets, if you do nothing ... it's clearly an easy option for the Council. In the past, nobody's been able to pick that up. There's no way of knowing unless you're really involved. But under this new structure of accounting for them, really, that has to be cut out. ... once a Council has decided on what level of service it wants to provide, it's a perfectly legitimate decision to decide not to do that and go below that. But it will stand out in the accounts and the annual plan [will show that] ... that's what they're doing and people can argue the merits of it, whereas, at the moment they can decide to do that and nobody has a clue whether they are or not.

Renewal accounting helps make the extent of maintenance and deferred maintenance on infrastructural assets transparent in the financial statements.

4.3 Reliability

Three interviewees expressed the belief that lack of information on infrastructural assets, difficulties in assessing asset condition, and uncertainties involved in estimating maintenance requirements, impose major limitations on the reliability of information reported under renewal accounting. One interviewee believed that local authorities are unlikely to be able to produce a reasonable assessment of the loss of service potential on infrastructural assets, because condition assessments, schedule of future works and determination of the annual charge required are severely deficient. From his knowledge of local authorities and the way they account for their infrastructural assets, he contended:

... their forward planning systems are severely lacking. They run on a three year cycle, and predominantly a one year cycle—'Well, what do we feel like doing next year?' Rather than questioning 'If we are to manage this monster forever. What is going to happen and needed to be done, in the next five, ten, twenty years?'

To manage infrastructural assets properly, the long term view needs to be determined which, in turn, provides the framework in which the requirements for the short term can be

assessed. Without this long term view he argued, the amount of expenditure on infrastructural assets each year does not give any indication about whether it is too much or too little to maintain the assets in perpetuity. Furthermore,

North Shore City Council has won the Accountant's Award for its accounts, two years running (not this year), and yet their infrastructural accounting is dismal. They just put a blanket provision of five million dollars in for renewals, have no idea how much or how little it should be! Nor, did they fund for it, so it wasn't put into the actual cash pricing. So they provided for it and then they deducted it out further down. So they're just kidding themselves and everyone else.

Four interviewees expected that once the necessary information is collected on pipelines and AMPs are fully developed, this will enable more reliable measures of loss of service potential to be reported.

Three interviewees claimed that depreciation tends to overstate the amount of loss of service potential in comparison with the amount of maintenance needed to maintain the infrastructural assets at a certain level of service potential. This overstatement arises because of the assumption that assets decline in a straight line over their useful lives, whereas, in practice, they tend to provide a relatively constant level of performance for most of their lives. The service potential of these assets will probably not have deteriorated by the rate calculated under traditional depreciation based upon inadequate information. Thus, only arbitrary assessments of expected useful lives can be made with such information. One engineer exclaimed:

... I'm the one that calculated the depreciation in the first place. I got it wrong. ... there's no doubt in my own mind, or, in fact, in everybody else's mind (might as well be up front about it), that it's wrong, and the sooner that we can get rid of it the better!

Moreover,

The exercise is based on the value of your asset. But then the key issue is trying to determine what the current value of your asset is or what's the depreciated value of your asset, and how much it is depreciating each year. Wow! I mean, given the time frames that we had to do that exercise, it was really best guess stuff.

However, despite this engineer's preference for renewal accounting, he also suggested that if the same rigour and approach with which they are applying to developing AMPs for their infrastructural assets went into developing traditional depreciation, then it may very well end up with similar results as renewal accounting. Similarly, another interviewee also suggested that the results of both approaches may be similar.

4.4 Management Support

Renewal accounting appears to support good management practice by reflecting and complementing the way infrastructural assets are managed and also encouraging a multi-disciplined management approach to infrastructural assets. Six interviewees expressed the belief that renewal accounting reflects and complements the way infrastructural assets are managed. Because it relies on AMPs for determining the amount of maintenance required, it is very much integral to the long term planning and management of infrastructural assets. One interviewee stated that renewal accounting is more closely aligned to the physical management of infrastructural assets and complementary to the need for a proper asset management system. Moreover,

I think the engineers, probably more so than the accountants, would value this approach because it matches what they're doing and they can see the emphasis coming on managing the asset.

Three interviewees indicated that renewal accounting encourages a multi-disciplined or integrated management approach to infrastructural assets. For example, two interviewees (an accountant and an engineer) indicated that they now work much more closely together than in the past and that renewal accounting, via its necessity for AMPs, requires a joint and multi-disciplined management approach. The engineer stated,

... I see that we used to some extent work more in isolation. Now we share our problems in a way that we do it together. I think it's much better. For example, ... [the Director of Finance and Administration has] got management accountants working with us and they have an understanding of our worries in a way that previous accountants never had in the past. They work with us and we talk things through. So I think that's one of the good things that comes out of it. You're effectively working together as a team. You've got a common target, a common goal.

The third interviewee also noted that these two management disciplines are starting to talk to each other in a common language. This has been facilitated by joint SOLGM seminars on the topic of infrastructural assets and the renewal accounting guidelines (SOLGM, 1994a).

4.5 Practicality

Renewal accounting was argued to be more practical than traditional depreciation by four interviewees. One of them asserted:

... from the practical point of view, if you are going to regard your city as going on into the future, then the practical way to deal with it is to capitalise your capital expenditure which extends the network, if you grow or change. And otherwise, you simply spend what

is necessary to keep those assets up to the standard that the Council decides in consultation with the community, to run those assets indefinitely into the future.

Traditional depreciation was considered impractical by three interviewees. One interviewee pointed out the following limitations:

The sheer practicalities of capitalising bits of the network and then figuring out which bit you'd replaced and writing that out of the system. And you're just depreciating bits and pieces. So the pure logistics of applying traditional depreciation is a factor. . . . renewal accounting avoids the logistical nightmare of identifying the components and depreciating them.

Despite claims of its practicality, renewal accounting may also be seen as a more convenient method. One interviewee suggested that some people appear to like renewal accounting because "it saves them a lot of bother". They just expense all expenditure on their infrastructural assets and this seems quite appealing, given the lack of information on their assets. Moreover,

For local authorities, you've got to bear in mind that they've come from the position not so long ago of having no balance sheet. All they had was just a cash trading account, which is pretty pathetic. . . . Many of them still don't have a decent balance sheet. They don't have a decent asset register of all their assets. They don't know their expected lives, the original, the replacement cost, or anything else much. And in that sort of circumstance it's quite appealing to just say 'Well, here's an easy way out. All we have to do is expense our renewals'. So everything's just expensed. You look at the Auckland City's accounts, it's an absolute nightmare. And the recent study of the Auckland water industry . . . noted that Auckland City is just expensing all their capital expenditure and therefore charging it through their prices immediately.

On the other hand, interviewees from two city councils indicated that traditional depreciation was adopted because, initially, it was the easiest option. Indeed, one interviewee noted that there was no other option, given that renewal accounting needed highly developed AMPs.

4.6 Costs of Information

Two interviewees discussed the costs involved under renewal accounting, in terms of setting up the necessary information and producing AMPs. One argued that such costs are a limitation, yet, the other exclaimed that people in the different divisions of his entity say something like:

'Oh God, all this work! Oh no, no, we don't want to do all this!' But then they say, 'But we've got to do this. We should have done this anyway'.

He contended that, although renewal accounting requires the development of AMPs, which is time consuming, such information is required anyway to manage infrastructural assets properly.

4.7 Understandability

Four interviewees argued that the concept of continually maintaining infrastructural assets is generally agreed to be logical and more easily understood than depreciation. Conversely, four interviewees indicated that one of the difficulties in adopting renewal accounting was getting the concepts across so that they could be understood by politicians. One interviewee stated that, furthermore:

... it's not understood by bankers and others. Therefore, it increases your borrowing risk and therefore cost. They'll either have to invest a lot of money and time in trying to understand the results. Or, they say 'Look we don't understand it, we'll just consider it a bit more risky than something else we do'.

Interviewees from two of the surveyed entities indicated that they had adopted traditional depreciation for their infrastructural assets because it was a widely understood and commercially accepted practice for fixed assets. By contrast, one interviewee saw the following advantage of the renewal over the depreciation method:

Now this depreciation argument's confused ... everybody, because they suddenly went back to the argument, 'Oh, we don't need to worry about capital works. We can spend whatever we like! Because what we're doing is loaning that bit of money, so who cares!' Now, under renewal accounting, and one of the reasons why I really like renewal accounting, is, there's your operational pool. And it's bigger than what it was before. We've lost depreciation, but we have renewals and replacements. And you fund that from rates. Here's your capital, and you fund that from loans. And that's it! No other scenarios. No depreciation coming in here, coming out there, doing all these things and confusing people. It's just rates, loans. 'What's the balance that you want?' Very, very simple. And it needs to be very very simple.

4.8 Funding Implications

Interviewees discussed three implications for the funding of expenditure under renewal accounting. First, five interviewees indicated that when AMPs are completed, this will provide a framework or justification for the work that the council does and, therefore, the determination and funding of maintenance and renewal requirements will be on a more rational basis than in the past.

Second, planned renewal and replacement expenditures are derived from the AMP and are funded from operating revenues. Two interviewees argued, therefore, that the political element of competing for funds for capital projects is virtually eliminated. Furthermore,

... from the engineering point of view, it really is a very fine concept. It makes money available to do the jobs we need. We don't have to go and win an argument over each individual project all the time. ... whereas in the past you might wheel up a whole lot of (what were then capital) jobs (to renew things), and they had to compete with others.

Politically, if you put in a new sewer or water main, [it] doesn't win a lot of votes, whereas to put in a new public hall, or something or other, does. And it had that kind of competitive element politically (which is not a good thing from the point of view of the assets). ... now we've got an automatic level of funding and they don't have to compete (well, we're able to spend on our needs within the budget) and it gets away from that political competitiveness.

Third, renewal accounting appears to have been adopted by one council because "huge" depreciation charges under traditional depreciation had caused operating deficits. The interviewee stated that his council had not fully funded the cost of depreciation from its general rates. Using renewal accounting in the last two years had enabled the council to make operating surpluses, a policy looked upon as favourable by "everyone", including lending institutions.

5. Chapter Summary

The majority of interviewees regarded infrastructural assets as systems or networks which are made up of individual components and maintained in perpetuity/indefinitely.

Valuations of pipeline infrastructural assets on a DRC basis appear to be limited due to inadequate information and the assumption of a straight-line deterioration. They should become more reliable as asset information systems such as PAMS are implemented and more information is collected.

Interviewees considered the management of infrastructural assets very important and therefore progress needs to continue in developing AMPs. Information on roads is good but this is not so for pipelines. Despite the lack of information on the condition of pipeline infrastructural assets, there is a lot of work being done in local government on a nation-wide basis (e.g. the development of PAMS). AMPs and related information systems are evolving and will not realise their full potential for some time yet.

Several difficulties in determining maintenance requirements were noted, the most significant of which is assessing the condition of pipeline infrastructural assets. Furthermore, it may be difficult to provide detailed financial information on maintenance costs beyond 10 years. Nonetheless, AMPs are expected to be useful as a long-term planning tool, to justify the level of expenditure required and to provide a more integrated approach to managing infrastructural assets. In addition, both future growth and inflation might be incorporated and perhaps customer focus groups should be used to consult with the public to determine levels of service in AMPs.

Significant increases in expenditure on infrastructural assets are expected in the future and therefore the issue of intergenerational equity arises. Two ways of funding large replacements of infrastructure were suggested: (1) providing for them in the years prior to replacement, or (2) by loan funding after replacement.

Increasing support for renewal accounting suggests that it is gaining the status of GAAP within New Zealand local government. This should be putting pressure on the NZSA to recognise it in its revised FRS for fixed assets and depreciation.

Two of the surveyed entities used an alternative form of depreciation accounting which appears similar to renewal accounting.

An indefinite useful life means that the network is required to provide a permanent service and is continually maintained by constant replacement and refurbishment of its parts, until a decision is made otherwise. Yet, only the network as a whole is deemed to have an indefinite life and not its individual components.

Clear definitions of revenue and capital expenditure are needed under both renewal accounting and traditional depreciation. However, proportional allocation under renewal accounting may be impractical or too costly. Furthermore, despite periodic maintenance and resurfacing treatments on roads, expenditure on major reconstruction is required eventually. There was a difference in opinion about whether this should be capitalised or expensed as an operational cost.

Scope for manipulation of provisions for deferred maintenance under renewal accounting should be reduced by auditing AMPs. In any case, determination of annual maintenance

requirements is separate from their funding. In some cases it may be justifiable to defer maintenance. Therefore, there is a need to define more clearly the allowable scope for such deferral.

Periods of rapid growth in newer cities in the last 20-30 years means that some networks are probably not in a steady state, and therefore the problem of lumpiness arises. Several ways to deal with this include: smoothing annual maintenance requirements; providing for an annual expense during the renewals holiday (although only one entity recognised this in practice), and accounting for large sub-components of networks separately. Furthermore, the forms of obsolescence identified will have implications for the measurement of expense under both renewal accounting and traditional depreciation.

A number of considerations relevant to using renewal accounting were identified. With only a few exceptions, interviewees favour renewal accounting because it:

- is logical, recognising the need to continually maintain infrastructural assets which provide an ongoing service. Conversely, traditional depreciation appears illogical and does not reflect the condition of assets which are maintained in perpetuity;
- makes maintenance and deferred maintenance on infrastructural assets transparent in the financial statements;
- supports good management practice by both complementing the way infrastructural assets are managed and encouraging a multi-disciplined management approach;
- seems to be more practical than traditional depreciation for infrastructural assets;
- does not appear to incur costs any greater than what an entity ought to incur in developing AMPs to manage its assets properly anyway;
- makes funding arrangements simpler than under traditional depreciation, at least in some cases, where renewal and replacement expenditure is simply funded from operational revenues;
- provides a rationale for the amount of maintenance required via the AMP; and
- helps reduce the political element of determining year to year levels of spending on infrastructural assets because they are derived from the AMP.

Interviewees regarded renewal accounting as having two chief limitations: (1) unreliability (due to inadequate information, lack of formal asset information systems and AMPs for pipeline assets); and (2) lack of understandability. In addition, given the lack of information and asset information systems for pipeline infrastructural assets, renewal accounting may be seen as an easy option to accounting for infrastructural assets "properly". Furthermore, in one case, renewal accounting appears to have been used for creatively reducing operating deficits previously incurred under traditional depreciation.

Chapter 10

DISCUSSION, LIMITATIONS, IMPLICATIONS AND CONCLUSION

1. INTRODUCTION	186
2. DISCUSSION	186
2.1 <i>Accounting Practices of Local Authorities</i>	186
2.2 <i>Accounting for and Managing Infrastructural Assets</i>	188
2.3 <i>Renewal Accounting</i>	192
2.4 <i>Generally Accepted Accounting Practice</i>	194
2.4.1 Relevance	195
2.4.2 Reliability.....	196
2.4.3 Understandability	197
2.4.4 Comparability.....	197
2.4.5 Costs versus Benefits	198
2.4.6 Objectives of a Good Accounting Policy for Infrastructural Assets	198
2.4.7 Authoritative Support	199
3. LIMITATIONS	199
4. IMPLICATIONS FOR PRACTICE AND FURTHER RESEARCH.....	200
5. CONCLUSION	203

1. Introduction

This chapter discusses the results of the survey of local authorities, outlines the limitations of the study and provides several implications for practice and further research. The main conclusions reached are presented at the end of the chapter.

2. Discussion

The discussion deals with the four main issues revealed from the survey, namely: (1) the accounting practices of local authorities; (2) issues concerning the definition of infrastructural assets, asset management plans and intergenerational equity; (3) the requirements of the renewal accounting method (as presented in Chapter 9); and (4) generally accepted accounting practice (GAAP) and consistency with both the qualitative characteristics of information in the Statement of Concepts (NZSA, 1993) and the objectives of a good accounting policy for infrastructural assets.

2.1 Accounting Practices of Local Authorities

The majority of the surveyed local authorities use the depreciated replacement cost method for valuing their infrastructural assets, as do most New Zealand local authorities (see Chapter 4, p. 56, Footnote 8). However, despite its widespread use, most of the surveyed entities' valuations on a DRC basis for pipeline infrastructural assets appear unreliable. This is because of the inadequacy of information on their condition.

One entity, Auckland City Council, disclosed its valuations for infrastructural assets in a manner like no other surveyed entity by showing a provision for accrued maintenance (see Chapter 8, p. 147). This is an estimate of the loss of service potential that has already occurred in the system (i.e. the depreciated component of the valuation figure), and is similar to accumulated depreciation under traditional depreciation. It is also similar to the "grossing up" option found in Australia for the revaluation of local government assets (see Chapter 3, p. 48).

Although information on roads is generally good, information about the condition of pipeline infrastructural assets continues to be inadequate. However, most of the surveyed

local authorities are implementing the PAMS system for their pipelines and are collecting further information to address this problem.

The study also reveals that the overwhelming majority of the surveyed local authorities do not have comprehensive AMPs for their infrastructural assets. This is a significant limitation, not only in terms of the management of infrastructural assets but because AMPs are an essential prerequisite for entities using renewal accounting.

The inadequacy of information on the condition of pipelines and lack of AMPs affects the reliability of judgments made about:

- (1) valuations on a DRC basis;
- (2) long term maintenance plans;
- (3) whether or not infrastructural systems are in a steady state;
- (4) long term financing decisions which have a bearing on intergenerational equity; and
- (5) the reliability of reported expenses under either renewal or traditional depreciation accounting.

However, once the required information on infrastructural assets and their condition is collected, and AMPs are fully completed, this will enable more informed decisions and the reliability of information reported for both internal management and financial reporting purposes (including valuations) should improve.

The Audit Office's (1995) follow-up review of local authorities acknowledged the extensive work undertaken by most councils and indicated that the most pressing issue is the implementation of systems to manage and monitor infrastructural assets (for a discussion, see Chapter 4, p. 68 et seq). Likewise, although much progress has been made by the surveyed local authorities, the importance of the continual implementation of formal asset information systems (i.e. PAMS) and development of AMPs for infrastructural assets is recommended as vital. However, it is important to realise that local authorities are in an evolutionary phase in this respect and it will take some time for AMPs to realise their full potential.

During this 'limbo' period (Smith, 1995), the surveyed entities using renewal accounting have adopted transitional approaches. They report maintenance requirements based on

engineers' best estimates, since AMPs do not currently exist to validate or provide a rationale for maintenance provisions. This situation is likely to remain until the information on the condition of infrastructural assets is collected and PAMS is fully implemented, thereby enabling AMPs to be completed. In the meantime, some local authorities have maintenance estimates reviewed by independent external engineers, providing some degree of verifiability in the interim. In any case, it is likely that even when AMPs are fully completed, the Audit Office will require that they be attested by an independent professional engineer (see Simpkins and Jensen, 1995a, p. 25, and Appendix 6).

Despite diversity in the accounting practices of the 12 local authorities surveyed, the majority (9) are using some form of renewal accounting for their infrastructural assets. The approaches used are consistent with the deferred maintenance approach described in the literature (see Chapter 5), and a discussion on the main requirements of the method follows later in this chapter.

Two surveyed entities used an alternative depreciation approach which earmarked funds generated from depreciation for capital expenditure programmes. While this is similar to renewal accounting, and a possible alternative way of recognising that infrastructural assets need to be continually maintained, renewal accounting appears preferable. Traditional depreciation is a process of cost allocation and is intended neither to be a method of generating funds for replacement, nor to reflect the actual condition and value of assets in the balance sheet. In addition, one of the two entities indicated its intention to switch to renewal accounting in the near future anyway. Nevertheless, the method remains a possible third alternative alongside renewal accounting and traditional depreciation.

2.2 Accounting for and Managing Infrastructural Assets

The consensus among interviewees' views was in accord with recognising that infrastructural assets are a conceptually distinct group, having the characteristics of networks which are intended to be maintained indefinitely by constant replacement and refurbishment of parts. Therefore, infrastructural assets may be defined as "networks which, as a whole, have indefinite useful lives even though individual components will

need to be replaced". When viewed as networks, typical examples include: water, wastewater (sewerage and drainage), roading, gas, electricity distribution and telecommunication systems.

The SOLGM (1994a) guidelines provide an operational definition which distinguishes between infrastructural and non-infrastructural assets and is useful for classification purposes. It classifies assets as infrastructural assets on the basis of their association with the network. A few interviewees also regarded the function of the asset and its association with the network as a way of determining the classification of assets in situations where the distinction is not so clear (i.e. grey areas).

A small minority of interviewees argued that if infrastructural assets were privately owned or operated on a commercial basis, then they would be classed as fixed assets or perhaps even liabilities. However, as already pointed out in Chapter 2, where infrastructural assets are defined in terms of networks with indefinite useful lives, the distinction between public or private sector ownership becomes unimportant for classification purposes. Furthermore, the existence of positive future cash inflows from an asset does not determine whether or not an asset meets the definition of an asset.

A small minority of interviewees supported the case made in the literature for recognising some public sector infrastructural assets as community assets, viewing such assets as being used by the community and generally not saleable (for a discussion see Chapter 2, p. 22). Perhaps this was because, for the majority of interviewees, the main concern with respect to infrastructural assets was their technical management, with an emphasis on the information and AMPs required to manage them properly. Furthermore, only local government managers were interviewed and not those necessarily with a concern for the social dimension of such assets, for example, their non-saleability.¹

The inclusion of parks and reserves as infrastructural assets by a few interviewees is consistent with the SOLGM (1992) definition, which defines infrastructural assets as not tradeable and providing an ongoing service to the community. However, if the SOLGM (1994a) definition is used, as advocated in this thesis, then parks and reserves would not

¹ In fact, the privatisation of local government infrastructural assets was a topic briefly mentioned by several interviewees.

be classed as infrastructural assets because they are not networks or systems of assets. Nevertheless, such assets might be classed as community assets, given their characteristics of being used by the community at large and that they are generally non-saleable or substitutable.

Several implications were raised by interviewees regarding AMPs. First, it may be difficult to provide detailed financial estimates of maintenance requirements for the long-term. As formal asset information systems for pipeline infrastructural assets are fully implemented and information on their condition becomes available, local authorities will be in a much better position to plan for long term maintenance requirements. Smith's (1995) suggestion of providing a supplement to the AMP, showing a detailed breakdown of expected maintenance costs over a period of three years, would provide detailed estimates for expenditure on infrastructural assets and a link with the annual planning process of local authorities in the short-term (Smith, 1995).

Second, there appears to be a reasonable argument for including future growth in AMPs so as to manage and plan for all aspects related to the management of infrastructural assets.

Third, it may also be useful to include inflation in AMPs and have projections in constant dollar terms, which, in turn, may assist in determining the effect of long term financing decisions which have a bearing on intergenerational equity.

Fourth, determining the levels of service for AMPs in consultation with the public provides an opportunity to have an input into the political and planning processes of managing local government infrastructural assets. Some interviewees indicated that customer focus groups, comprising representatives from the public, would be used as a vehicle for consulting the public about agreement on levels of service in the AMP. Perhaps this is a way to recognise the social dimension of public sector infrastructural assets. As pointed out in Chapter 2, the social dimension of such assets requires the consideration of the rights of the public at large to participate in decisions relating to their use (Pallot, 1995). Accordingly, it may be appropriate to require levels of service in

AMPs to be agreed to in consultation with the public for public sector infrastructural assets.

Increases in expenditure on infrastructural assets are expected in the future because of either increasing demand and the need for expansion of services, or rising environmental standards which require an upgrade in facilities. The long term implications of such expenditures will need to be incorporated into AMPs and into long term financial strategies, such as those proposed under the Local Government Law Reform Bill 1994.

Large replacements of infrastructure have significant implications for intergenerational equity because they affect more than one generation—both in terms of the burden of costs and receipt of benefits. Interviewees regarded intergenerational equity to be achieved where the current generation is paying for the cost of the current year's services, through either annual depreciation (under traditional depreciation) or renewal and replacement expenditure (under renewal accounting). This notion is consistent with the literature, where it was noted that each generation should pay for its share of the full costs of the services received from infrastructural assets.

Two methods of financing large replacements were suggested by the interviewees: (1) providing for replacements in the years prior to actual replacement, and (2) funding replacements by way of debt after actual replacement. The first of these methods involves obtaining funds before actual replacement and, as mentioned in Chapter 4, ratepayers dislike councils accumulating large cash reserves (Simpkins and Jensen, 1995a). Thus, the second method, financing large replacements by way of debt, appears to be politically more acceptable.

One interviewee indicated that where the council has borrowed to construct assets and is also fully maintaining them, then they should not pay off the debt. Whether or not this is equitable will need to be determined in light of the previous, current and future generations' contribution to the costs of providing infrastructural assets as against the benefits received by each generation. The ability to determine intergenerational issues will be enhanced as more information on the condition of local authorities' infrastructural assets becomes available and long term plans (including AMPs) are developed.

2.3 Renewal Accounting

Interviewees' opinions about the main requirements of the renewal accounting method were generally consistent with the literature and are discussed below.

Both the interviewees and the literature considered an indefinite useful life to mean that infrastructural assets are continually maintained through constant replacement and refurbishment of parts, until a decision is made otherwise. The useful life of the network, as a whole, is considered to be indefinite (though individual components will be replaced), and therefore cannot be easily determined or specified. The SOLGM (1994a) guidelines support this assumption by requiring a formal commitment by the entity's governing board to maintain the infrastructural assets indefinitely and maintain comprehensive AMPs.

Rigorous operational distinctions between revenue and capital expenditure are needed not only under renewal accounting, but also under traditional depreciation (to avoid double counting). The definitions of revenue and capital expenditure used by the surveyed entities using renewal accounting are consistent with the SOLGM (1994a) categories of expenditure. Likewise, some of the surveyed entities also classified expenditure as the SOLGM (1994a) categories do into three groups: (1) capital expenditure, (2) renewal expenditure, and (3) repairs and maintenance.

One interviewee indicated that he was confused sometimes over the classification of backlog expenditure (previous deferred maintenance) under renewal accounting. The OFWAT (1993a) guidelines recommend that backlog expenditure be capitalised in order to bring systems up to the level of operational effectiveness required. Similarly, the SOLGM (1994a) guidelines also note that it may be necessary to capitalise backlog expenditure and recommend that any policy which reduces it should include the time period allowed while also being affordable and achievable.

Two interviewees suggested that proportional allocation under renewal accounting may be impractical or too costly. The SOLGM (1994a) guidelines recommend proportional allocation but also recognise that it may be necessary for a more precise apportionment between revenue and capital expenditure. Therefore, judgement may be needed to determine a fairer allocation between renewal and capital, whether the benefits of

proportional allocation exceed the costs of doing it in practice, and whether or not expenditure which results in an increase in service capacity should be capitalised.

The classification of major reconstruction expenditure on roads will depend upon the accounting treatment used. Under traditional depreciation, it would clearly be capitalised. Under renewal accounting, this expenditure should be expensed where it does not increase the overall service capacity of the road. Such expenditure merely sustains and restores the road's service potential. Although the patterns of expenditure on roads are not necessarily smooth, this will have implications for road planners when determining maintenance requirements.

Unlike the forms of renewal accounting used by railroads in the nineteenth century (see Chapter 5, p. 79), recent forms of renewal accounting would not afford the same scope for manipulation of planned annual maintenance provisions. The scope for manipulation is likely to be further reduced where AMPs specify annual maintenance requirements (thereby making the decision to fund actual maintenance distinct from recording it), and changes are well documented and disclosed. Furthermore, as suggested by several interviewees, requiring AMPs to be subject to audit would provide a check on the annual maintenance provisions which are outlined in the AMP, those used for financial reporting purposes, and the reasons for any adjustments.

Whereas only a few of the older and larger city councils indicated that their infrastructural networks were in a steady state, a number of newer cities have had large periods of growth and development in the last 20-30 years. As more information becomes available on the condition and range of expected useful lives of component assets, it should become possible to determine whether or not such networks are in a steady state.

High growth presents the problem of lumpiness under renewal accounting. The methods suggested by interviewees to deal with this problem were consistent with the literature (see Chapter 5, p. 94 et seq.), and include: (1) separate accounting treatment of large sub-

components of the network; (2) smoothing of maintenance requirements; and (3) charging an annual expense during the renewals holiday.²

Judgement is necessary to determine the best policy which accurately measures losses of service potential under renewal accounting. This might include a combination of some or all of the above options.

A few local authorities used hybrid renewal accounting approaches which employed traditional depreciation for some assets within their networks, such as sewerage treatment plants, pumps and bridges. Perhaps it may also be appropriate to use traditional depreciation for other identifiable assets with determinable useful lives within infrastructural networks, for example, traffic lights in roading networks.

Interviewees also identified several forms of obsolescence which will have implications for their accounting treatment under either renewal accounting or traditional depreciation. Obsolescence might be accounted for under either method by recognising a depreciation charge for the asset over the period of time anticipated between recognition of the obsolescence and replacement of the asset (Ministry of Commerce, 1994b, p. 15).

2.4 Generally Accepted Accounting Practice

Both the literature and the results of the study highlight the diversity in accounting practices within New Zealand local government. The need for a GAAP for infrastructural assets is therefore apparent and requires resolution.

As indicated in Chapter 4, the Local Government Law Reform Bill 1994 proposes to define GAAP more tightly. Where no provision is made in approved financial reporting standards (FRS) or any applicable law, accounting policies will need to meet two criteria. First, the accounting policy must be deemed appropriate for local authorities. Second, the accounting policy must have authoritative support within the accounting profession of New Zealand.

² Note, however, that the Audit Office is likely to require traditional depreciation for new networks or those with significant new portions (see Simpkins and Jensen, 1995a, p. 25, and Appendix 6).

With respect to the first criterion, the Statement of Concepts' (NZSA, 1993) qualitative characteristics, as outlined in Chapter 4, can be used to determine the usefulness of information and appropriateness of accounting methods proposed for infrastructural assets. These characteristics include: relevance, reliability, understandability, comparability, and the constraint of costs versus benefits. Both the renewal accounting and the traditional depreciation methods are examined using these qualitative characteristics. The discussion comprises the merits and demerits of both approaches from the literature and also from interviewees' views in the survey. This is followed by an examination of both approaches for consistency with the objectives of a good accounting policy for infrastructural assets; these were also outlined in Chapter 4 (see p. 58).

2.4.1 Relevance

Although either method may produce similar reported expenses (if done properly, see Simpkins and Jensen, 1995a), it is arguable that renewal accounting is more relevant than traditional depreciation for infrastructural assets because it:

- makes the extent of maintenance and deferred maintenance on infrastructural assets transparent in the financial statements, therefore, providing information which is useful for both assessing the extent to which intergenerational equity is maintained and the performance of management;
- encourages and supports good asset management practice by:
 - (1) complementing the way infrastructural assets are managed;
 - (2) recognising the need to continually maintain infrastructural assets and helping to ensure that maintenance is properly funded (because maintenance requirements are derived from the AMP); and
 - (3) encouraging a multi-disciplined management approach to developing AMPs for infrastructural assets; and
- recognises the public nature of government, where levels of service in the AMP are agreed in consultation with the public (Pallot, 1995).

In contrast, traditional depreciation is relatively divorced from the engineering side of infrastructure management (Simpkins and Jensen, 1995a; Smith, 1995, NSW Treasury, 1989), and, as some interviewees argued, is illogical in view of that fact that infrastructural assets are required to be maintained indefinitely. Furthermore, although consistent with

GAAP, it does not provide relevant information about the extent of maintenance and deferred maintenance on infrastructure assets (Simpkins and Jensen, 1995a).

2.4.2 Reliability

The reliability of information reported by the surveyed entities under either method appears questionable. The majority of the surveyed local authorities have inadequate information on the condition of their pipeline infrastructural assets and lack AMPs. For entities using renewal accounting, this means that without comprehensive AMPs, they cannot demonstrate reliably that the service potential of the network is being fully maintained. Furthermore, in Chapter 4 it was noted that methods of accounting, other than allocations of cost, will be consistent with the Statement of Concepts' definition of expenses only where they can be measured reliably. Therefore, the questionability of reported information is a major short-coming of the renewal accounting approaches being used by the surveyed entities.

Whereas traditional depreciation may be an easier option to adopt initially, especially where there is a lack of information on infrastructural assets and AMPs do not exist, it is also open to subjective assessment. Given the inadequacy of information on the condition of infrastructural assets, which is common to nearly all of the surveyed entities (and local authorities in general), the judgements made under traditional depreciation are probably just as unreliable as those under renewal accounting. Under these circumstances, depreciation rates are likely to be arbitrary, as frequently argued in the literature (see Chapter 6, p. 104).

Once the necessary information is collected on infrastructural assets and AMPs are fully developed, then the reliability of information reported for both financial reporting and management purposes should improve substantially, whether under traditional depreciation or renewal accounting. Furthermore, if both methods are done well, then they may produce similar measures of loss of service potential in the financial statements (see Simpkins and Jensen, 1995a).

In particular, for entities using renewal accounting, information reported should become more reliable because the AMP will provide the rationale for maintenance, reducing scope

for management manipulation. Local authorities using renewal accounting will then be immune from the criticism of taking an “easy way out” of properly accounting for infrastructural assets, that is, merely expensing all expenditures on renewals and replacements without knowing how much or little maintenance is actually required. However, renewal accounting should not be adopted for reasons such as reducing operating deficits, as one surveyed entity appears to have done. Such creative accounting may have concealed a shortfall of revenue necessary to cover operating costs.³ Any accounting policy adopted for infrastructural assets should be more concerned with providing relevant and reliable information rather than reducing reported operating deficits.

2.4.3 Understandability

Renewal accounting appears to be difficult for politicians and others, such as bankers and analysts, to understand (although some interviewees suggested that the concept of continually maintaining infrastructural assets appears to be more easily understood than concepts of depreciation). This is to be expected given the recency of the adoption of renewal accounting by local authorities, as a result of the reforms in 1989. Users of financial reports will be less familiar with renewal accounting than with traditional depreciation. This suggests that information needs to be communicated to users of financial reports prepared on a renewal accounting basis. Perhaps this could be addressed by incorporating renewal accounting into a FRS which, in turn, could provide and promote a GAAP for local authorities to follow. Documenting an acceptable form of renewal accounting, and communicating this to both preparers and users of financial reports, would hopefully improve understandability over time.

2.4.4 Comparability

Diversity in practice and lack of GAAP among local authorities also has a bearing on the comparability of financial information reported under either renewal accounting or traditional depreciation. Lack of GAAP hinders not only comparability of financial reports from year to year but also with other entities, and is therefore a consideration relevant to

³ Note that the Christchurch City Council incurred a very large operating deficit because of the impact of including the full cost of depreciation on infrastructural assets in its financial statements. However, to eliminate the deficit, the Council decided to gradually increase its revenue by levying higher rates over a period of five years (see Christchurch City Council, 1994a, p. 8, and 1994b, p. 9).

local authorities using either method for their infrastructural assets. A GAAP is therefore needed to improve both comparability and understandability of financial reports by local authorities.

2.4.5 Costs versus Benefits

The costs of providing the information necessary for renewal accounting do not appear to be significantly more than the costs an entity incurs to manage its infrastructural assets properly. In accord with arguments put forward in the literature, the complexities involved in managing infrastructural assets need to be understood and AMPs are required anyway (Duncan, 1995; Lewis, 1992). Furthermore, the Ministry of Commerce (1994b) indicates that the compliance costs of renewal accounting appear to be lower than under traditional depreciation. This seems reasonable, given that traditional depreciation is, as one interviewee stated, a “logistical nightmare” and because, as other interviewees argued, renewal accounting is a more practical approach.

2.4.6 Objectives of a Good Accounting Policy for Infrastructural Assets

The objectives of a good accounting policy were outlined in Chapter 4 (see p. 58). Findings from the literature and the interviewees’ views suggest that renewal accounting meets the first and third of these objectives. That is, (1) providing information on the extent to which infrastructure is maintained, enabling the performance of management to be assessed, and (3) supporting or encouraging good management of infrastructure assets. Conversely, traditional depreciation meets neither of these objectives. It fails to provide relevant and useful information about maintenance and deferred maintenance, and is relatively divorced from the management of infrastructural assets.

With respect to the second objective (i.e., providing sufficient information on costs, efficiency and service performance), annual reported expenses under either method should provide information on the costs and efficiency of providing services. However, as indicated previously, the reliability of information reported by local authorities under both approaches is questionable because of the inadequacy of information on infrastructural assets, particularly pipelines. The reliability of information reported under either method should improve once the necessary information becomes available and AMPs are completed. Moreover, information on the service performance of local authorities is

unlikely to be provided directly under either method. However, AMPs could provide the “genesis” of information on the service performance of the network under either approach (e.g., levels of service), thereby assisting with performance measures for non-financial reporting purposes (see Smith, 1995, p. 13).

Renewal accounting should provide benefits which exceed its costs because its information requirements are in harmony with those required for the management of infrastructural assets anyway.

2.4.7 Authoritative Support

The second criterion required to comply with GAAP is that the accounting policy needs to have authoritative support within the accounting profession of New Zealand. However, it is unclear whether or not the NZSA supports renewal accounting, despite one interviewee’s claims.⁴ Furthermore, the author is not aware at the time of writing of any public endorsement or acceptance of renewal accounting by the NZSA.

Nevertheless, there is support for the use of renewal accounting for infrastructural assets from the Audit Office (e.g., see 1994a; as also indicated from several interviewees). Furthermore, the widespread use of renewal accounting within local government should be putting pressure on the NZSA (now called the Institute of Chartered Accountants of New Zealand),⁵ to incorporate it into its exposure draft on the revised FRS for fixed assets and depreciation.

3. Limitations

Four limitations of the research method are discussed below. First, where not supported by other evidence, the size and judgemental nature of the sample have limited the generalisability of the interview findings. A wider coverage of views was not considered necessary because of the exploratory nature of this thesis. Nevertheless, tentative

⁴ Correspondence with the NZSA yielded no clear indication of whether or not it supports renewal accounting for infrastructural assets. A letter was sent to the NZSA’s Accounting and Professional Standards Department (which is responsible for the development of financial reporting standards and guidelines, see NZSA, 1996), in August 1995. It asked if the NZSA intends supporting renewal accounting, depreciation accounting, or accommodating both approaches within its revised financial reporting standard on fixed assets and depreciation. A copy the reply is shown in Appendix 13.

⁵ The new name took effect from 1 October 1996 (Notley, 1996).

theoretical generalisations can be made about concepts relating to accounting for, and managing, infrastructural assets.

Second, the research obtained only the views of management. It may be revealing to survey the views of external users of financial reports, such as ratepayers and creditors.

Third, bias is likely to be inherent in the interview process, especially since the researcher was not a trained interviewer (see Richardson et al, 1965). However, the author was aware of the constant potential for bias and, to minimise this limitation, a conscious attempt was made to conduct the interviews in as neutral manner as possible. Moreover, because a semi-structured interview format was used, then the same questions were not asked of every interviewee. Consequently, important information may have been omitted and the views of the interviewees may not have been fully represented in the data collected.

A fourth limitation lies in the subjectivity inherent in coding textual data, identifying categories and common themes or patterns within the data, and deciding what information is important to analyse and report. Another researcher may have placed more emphasis on different aspects of the data and presented different results.

4. Implications for Practice and Further Research

Despite the above limitations, the research has highlighted a number of implications for practice and further research.

Condition ratings of pipeline infrastructural assets are difficult to determine. This area needs more research by engineers. Appropriate measures and ratings will improve the reliability of judgements made about the valuation of infrastructural assets, long term planning and maintenance requirements, and the financial information reported under either renewal or traditional depreciation accounting by local authorities.

There is a need for further examination of several aspects of AMPs:

- (1) long term planning of maintenance requirements for infrastructural assets are hard to determine with reliability. This is a potentially significant limitation, particularly because AMPs may be required for time frames of 20 years or more. The merits of providing a supplement to the AMP, showing detailed cost estimates for the ensuing three years (Smith, 1995), should be investigated further;
- (2) several interviewees indicated that they would determine service levels in consultation with the public via customer focus groups. Where it is considered important to recognise the public nature of government, this is perhaps one way of preserving the role of democratic decision making over public funds with respect to public sector infrastructural assets (see Pallot, 1995). Whether or not public sector entities should be legally required to consult with the public concerning the levels of service in AMPs is another area for further examination, as is the use of customer focus groups;
- (3) issues which are relevant to managing infrastructural assets, such as future growth and/or inflation, might be included in AMPs; and
- (4) AMPs might be used to define measures used for non-financial reporting, as suggested by Smith (1995), therefore, integrating managerial activities with service performance reporting for infrastructural assets.

In future, it is likely that local authorities will be required to prepare 10 year financial strategies (via provisions in the proposed Local Government Law Reform Bill 1994). Moreover, significant increases in expenditure on infrastructural assets are also expected in the future. As local authorities tackle the problems of long term planning and funding decisions with regard to infrastructural assets, the issue of intergenerational equity will receive increasing attention (Taylor, 1995, p. 4). Decisions which have a bearing on intergenerational equity will have implications for the strategic plans, AMPs, long term financing decisions and the annual planning and reporting of local authorities. A detailed examination of how intergenerational equity can be achieved when determining long term financing for infrastructural assets would be worthwhile.

Using alternative accounting methods and forms of disclosure of information for infrastructural assets is another area for further investigation. Five suggestions are:

- (1) 'Renewal Accounting Summaries', or other forms of disclosures of maintenance and deferred maintenance, can be included as supplementary information in the financial

statements. Such summaries make the extent of maintenance and any deferred maintenance on each infrastructural asset transparent.

- (2) Other forms of disclosing information about maintenance and deferred maintenance on infrastructural assets could be investigated. Should entities use traditional depreciation, provided they disclose the planned maintenance (derived from the AMP), actual maintenance and the reasons for any deferred maintenance in the notes to the financial statements?
- (3) Although renewal accounting appears preferable, should an alternative form of depreciation accounting, as used by two of the surveyed entities, be permitted for accounting for infrastructural assets (i.e., earmarking funds generated from depreciation to capital works programmes)? Further investigation may be required to determine the best approach.
- (4) Disclosing a provision for accrued maintenance, as used by Auckland City Council and similar to the “grossing up option”, is an attempt to represent how much depreciation has already occurred in the system. The “grossing up” option might be more thoroughly examined for use under either renewal or traditional depreciation accounting (for a discussion see Simpkins and Jensen, 1995a, p. 9); and
- (5) Examination of how provisions for maintenance should be handled when infrastructural assets are revalued is another area for possible investigation. The implications are significant, particularly if the provision is very large. Perhaps the “grossing up” option could also be used in such circumstances.

Four implications are evident concerning the accurate measurement of loss of service potential under renewal accounting, particularly where networks are not in a steady state or are relatively new. They are:

- (1) Simpkins and Jensen’s (1995a) proposal of using ‘modified renewal accounting’ for networks with large sub-components;

- (2) consideration of whether traditional depreciation is more appropriate for networks which are relatively new or have significant new portions, or alternatively, charging an expense similar to depreciation during the renewals holiday;
- (3) using an annualised charge for maintenance to smooth the impact of fluctuations in expenditure on infrastructural assets (as provided in the SOLGM (1994a) guidelines); and
- (4) accounting for obsolescence of infrastructure (a concern which also needs to be addressed under traditional depreciation policies).

These implications might be considered for inclusion in future SOLGM guidelines and any other renewal accounting policy promulgated or used for infrastructural assets.

Finally, the SOLGM (1994a) guidelines appear to have general acceptance within local government and provide a good description of the deferred maintenance form of renewal accounting for infrastructural assets. The guidelines were developed by a wide range of local government representatives and are consistent with renewal approaches in other sectors (Pallot, 1995; Taylor, 1995). These guidelines could provide standard-setters (particularly the NZSA Financial Reporting Standards Board)⁶ with a form of renewal accounting useful for financial reporting purposes. They could be incorporated into the forthcoming exposure draft of the revised FRS for fixed assets and depreciation, thereby prescribing an alternative to traditional depreciation and a GAAP for infrastructural assets.

5. Conclusion

This thesis studied recent developments in accounting for infrastructural assets in New Zealand local government. A comprehensive synthesis of the literature was undertaken and the views of 13 accounting and five engineering managers from within the nine largest city councils, two district councils, and a local authority trading enterprise were surveyed.

⁶ The Financial Reporting Committee 2 of the NZSA Financial Reporting Standards Board is currently working on the exposure draft of the FRS which is expected to cover the revision and merger of SSAP 3 and SSAP 28 (Jensen, 1996, p. 64).

The survey found that local government managers perceive asset management planning for infrastructural assets to be very important. Consequently, there is a concerted effort toward collecting information on infrastructural assets and developing AMPs. Developments in these areas, particularly for pipelines, will improve the reliability of information for both internal management purposes and for general purpose financial reporting, whether under renewal accounting or traditional depreciation. However, the full benefits of improved asset management will not be realised for some time.

Despite the lack of consensus on a definition and the lack of GAAP for infrastructural assets in the literature, the findings of this study suggest that these issues can be resolved. First, infrastructural assets need to be defined and identified as a separate category of assets for accounting purposes. The consensus among the interviewees was that infrastructural assets have the characteristics of networks with indefinite useful lives. Therefore, they may be defined as “networks which, as a whole, have indefinite useful lives even though individual components will need to be replaced”. Typical examples include: water, wastewater, roading, gas, electricity and telecommunication networks.

Second, the study revealed that renewal accounting has widespread acceptance within New Zealand local government. Arguably, it is the preferred alternative for accounting for infrastructural assets. This is because it contributes to better asset management and planning for infrastructural assets; it responds to the most significant information need of external users (with respect to infrastructure), by making maintenance and deferred maintenance transparent; and it supports the democratic process by recognising the public nature of government (where levels of service in AMPs are agreed in consultation with the public).

Renewal accounting is therefore an appropriate accounting policy for the infrastructural assets of local authorities and is a viable alternative to traditional depreciation; though either approach may produce similar reported expenses in the financial statements. The SOLGM (1994a) guidelines, together with the implications raised in this thesis, could be used as a basis for defining an acceptable form of renewal accounting for financial reporting purposes.

Following the direction suggested by the interviewees' views canvassed in this thesis, the next stage requires the development of a FRS which addresses the renewal accounting method and the circumstances under which it should be applied.

ACKNOWLEDGMENTS

Thesis writing seems to bring out the procrastinator in all of us. There is probably no mystery about it: we all fear failure, but many of us also fear success, for we know that more will be expected of us if we succeed. The safest thing, then, is to hover somewhere between success and failure, always remaining in transit.¹

This thesis would not have been possible without the help and support of many people. Naturally, any errors and/or omissions are the sole responsibility of the author.

Firstly, I wish to thank my Mother for her constant encouragement, intercession and support—emotional, spiritual and otherwise—without which, my achievements during the past few years would have been attained with much more difficulty. I also thank my Father for his sense of humour, his integrity and for the hard ‘graft’ which he invested a very long time ago to make my education possible.

I wish to thank my thesis supervisor, George Thompson, for his many useful suggestions and for proof reading numerous drafts. I have enjoyed discussing all manner of subjects with him and am grateful to have known him during my time at the University of Canterbury.

I thank both Jamie and Kathy Ewen, two of my closest friends, whose friendship I appreciate very dearly. I also thank Paul Robinson for his friendship during some of the most difficult times, my Aunt Val and Uncle Mike, for always being there (and for paying their taxes), and my younger brother, Anthony, for the pleasure he gives me in the pursuit of his passion and pastime—golf.

I thank Ross Banbury for his constant encouragement and invaluable input throughout the duration of this thesis and also the opportunity to work alongside him at Seaview Youth.

I thank my fellow master’s colleagues for their friendship and support during the M.Com. programme. In particular, I thank both Celestine Walkey and Scott Tobin, whose friendship and mutual experience will not be forgotten, particularly for proof reading and encouraging me to go the full distance, and also Dane Howarth and Andrea Hale.

I am sincerely grateful to Adrian Sawyer, Lecturer, AFIS Department, University of Canterbury, for his diligence in proof reading and useful suggestions to improve the final version.

I also wish to thank the academic and administrative staff of the AFIS Department for their assistance. In particular, I thank Sue Newberry, Kerry Jacobs, Yvonne Shanahan and Beverley Lord for their useful suggestions, and for technical support, Peter Hinchey and Brendan Queree. Moreover, I thank Mui Leng Thai and Kathryn Perry and acknowledge the financial contribution from both the University of Canterbury and the Lester Fund.

I wish to thank all those people in New Zealand local government who assisted me. In particular, I thank Brian Smith of Audit New Zealand, Christchurch, for his valuable time, helpful suggestions and for providing me with relevant literature. Furthermore, I am grateful to all of the local government managers who participated in the interviews.

¹ Madsen, D., (1992) *Successful Dissertations and Theses*, 2nd ed., Jossey-Bass Publishers, San Francisco, p. 9.

Finally, I thank the One who provided me with the inspiration at the outset and Who gave me the grace to remain in 'transit' throughout the course of this degree—Christ, the hope of glory (COL. 1:27).

James Doyle



University of Canterbury, October 1996

BIBLIOGRAPHY

- Abdel-khalik, A.R., and B.P. Ajinkya, (1979) *Empirical Research in Accounting: A Methodological Viewpoint*, American Accounting Association, Sarasota, Florida.
- Accountant, (1885) November 14, p. 30, in Brief, R.P., (1966) "The Origin and Evolution of Nineteenth-Century Asset Accounting", *Business History Review*, Vol. 40, pp. 1-23.
- Advisory Commission on Intergovernmental Relations, (1984) *Financing Public Physical Infrastructure*, Commission Report, Government Printing Office, Washington, D.C., June.
- Aiken, M., (1994) "Parliamentary Sovereignty and Valuation Accruals: Uncongenial Conventions", *Financial Accountability & Management*, Vol. 10, No. 1, February, pp. 17-32.
- Anderson, B., (1992) "Have New Accounting Standards Improved Financial Management?", *Accountants' Journal*, June, pp. 39-40.
- Anthony, R.N., (1994) "In Lieu of Depreciation", Working paper, Harvard Business School, Harvard University, Boston, Massachusetts.
- Associated General Contractors of America, (1982) *Our Fractured Framework: Why America Must Rebuild*, Associated General Contractors of America, Washington, D.C., in van Daniker, R.P., and V. Kwaitkowski, (1986) *Infrastructure Assets: An Assessment of User Needs and Recommendations for Financial Reporting*, Research Report, Governmental Accounting Standards Board, Stamford, Connecticut.
- Attmore, R.H., J.R. Miller, and J.R. Fountain, (1989) "Governmental Capital Assets: The Challenge to Report Decision-Useful Information", *Government Finance Review*, August, pp. 13-17.
- Auckland City Council, (1992) *Auckland City Council Annual Report 1991-1992*, Auckland City Council, Auckland.
- Auckland City Council, (1993) *Auckland City Council Annual Report 1992-1993*, Auckland City Council, Auckland.
- Auckland City Council, (1994) *Auckland City Council Annual Report 1993-1994*, Auckland City Council, Auckland.
- Auckland City Council, (1995) *Auckland City Council Annual Plan and Budget 1995/96*, Draft, Auckland City Council, Auckland.
- Audit Office, (1991) *Report of the Controller and Auditor-General on Local Government*, Parliamentary paper B.29c, Audit Office, Wellington, June.
- Audit Office, (1992) *Report of the Controller and Auditor-General on Local Government and Other Matters*, Parliamentary paper B.29c, Audit Office, Wellington, August.

- Audit Office, (1993a) *Report of the Controller and Auditor-General on the Financial Condition of Regional and Territorial Local Authorities*, Audit Office, Wellington, December.
- Audit Office, (1993b) *Report of the Controller and Auditor-General: First Report for 1993*, Parliamentary paper B.29[93a], Audit Office, Wellington.
- Audit Office, (1993c) *Report of the Controller and Auditor-General: Second Report for 1993*, Parliamentary Paper B.29[93b], Audit Office, Wellington.
- Audit Office, (1994a) *Report of the Controller and Auditor-General: Second Report for 1994*, Parliamentary paper B.29[94b], Audit Office, Wellington.
- Audit Office, (1994b) *A Guide to Monitoring the Financial Condition of Local Authorities*, Audit Office, Wellington, March.
- Audit Office, (1995) *Report of the Controller and Auditor-General: First Report for 1995*, Parliamentary paper B.29[95a], Audit Office, Wellington.
- Audit Office, (1996) *Report of the Controller and Auditor-General: Second Report for 1996*, Parliamentary paper B.29[96b], Audit Office, Wellington.
- Australian Accounting Research Foundation (AARF), (1992) *SAC 4 – Definition and Recognition of the Elements of Financial Statements*, Statement of Accounting Concepts, Australian Accounting Research Foundation, Melbourne, Australia, March.
- Australian Accounting Research Foundation (AARF), (1994) *Australian Accounting Standard AAS 27, "Financial Reporting by Local Governments"*, Issued on behalf of the Australian Society of Certified Practising Accountants and the Institute of Chartered Accountants in Australia, Prepared by the Public Sector Accounting Standards Board of the AARF, August.
- Banks Peninsula District Council, (1992) *Banks Peninsula District Council Annual Report for the Year Ending 30 June 1992*, Banks Peninsula District Council, Lyttelton.
- Banks Peninsula District Council, (1993) *Banks Peninsula District Council Annual Report for the Year Ending 30 June 1993*, Banks Peninsula District Council, Lyttelton.
- Banks Peninsula District Council, (1994) *Banks Peninsula District Council Annual Report 30 June 1994*, Banks Peninsula District Council, Lyttelton.
- Banks Peninsula District Council, (1995) *Banks Peninsula District Council 1995/96 Annual Plan*, Banks Peninsula District Council, Lyttelton.
- Barton, A.D., (1982) *Objectives and Basic Concepts of Accounting*, Accounting Theory Monograph No. 2, Australian Accounting Research Foundation, Melbourne, Australia.
- Baskerville, R., (1996) "Revision Update", *Chartered Accountants Journal*, Vol. 75, (6), July, pp. 62-63.
- Beacock, G., (1988) "Capital Accounting: History and Options", *Public Finance and Accountancy*, 12 February, pp. 7-9.

- Bell, J., (1993) "Planning and Conducting Interviews", Chapter 8, in *Doing Your Research Project: A Guide for First-Time Researchers in Education and Social Sciences*, 2nd ed., Open University Press, Milton Keynes, England.
- Brady, K., (1993) "Long Term Financial Planning", *Address to the Local Government Association Conference*, Invercargill, 14 June.
- Brief, R.P., (1965) "Nineteenth Century Accounting Error", *Journal of Accounting Research*, Vol. 3, pp. 12-31.
- Brief, R.P., (1966) "The Origin and Evolution of Nineteenth-Century Asset Accounting", *Business History Review*, Vol. 40, pp. 1-23.
- Brownell, P., (1995) *Research Methods in Management Accounting*, Coopers & Lybrand/AAANZ, Melbourne.
- Bruns, Jr., W.J., (1989) "A Review of Robert K. Yin's 'Case Study Research: Design and Methods,'" *Journal of Management Accounting Research*, Fall, pp. 157-163.
- Bryman, A., and R.G. Burgess (eds.), (1994) *Analyzing Qualitative Data*, Routledge, London.
- Buchanan, D., D. Boddy, and J. McCalman, (1988) "Getting In, Getting On, Getting Out, and Getting Back", in Bryman, A., *Doing Research in Organisations*, Routledge, London.
- Burns, P., (1989) "A Matter of Maintenance", *Chartered Accountant*, March, p. 14.
- Burns, P., (1991) "Asset Replacement: The Size of the Problem", in *Asset Management in the Public Sector*, Proceedings of the National Conference—Managing Australia's Assets, Lakeside Hotel, Canberra, 16-17 July, 1990, published in the *Canberra Bulletin of Public Administration*, No. 65, Royal Institute of Public Administration (ACT Division), Canberra.
- Canadian Institute of Chartered Accountants (CICA), (1989) *Accounting and Reporting for Physical Assets by Governments*, Research Report, Canadian Institute of Chartered Accountants, Toronto, Canada, August.
- Chartered Institute of Public Finance and Accountancy (CIPFA), Capital Accounting Steering Group, (1990) *Capital Accounting in Local Authorities*, Final Report, CIPFA, London, September.
- Chatfield, M., (1974) *A History of Accounting Thought*, The Dryden Press, Illinois.
- Chin, D., (1993) "Accountability and Financial Reporting in Local Government", *Public Sector*, Vol. 16, (3), pp. 10-13.
- Choate, P., and S. Walter, (1981) *America in Ruins: The Decaying Infrastructure*, Council of State Planning Agencies, Washington, D.C., Reprinted in Barker, M., (ed.), *Rebuilding America's Infrastructure: An Agenda for the 1980s*, Duke University Press, Durham, N.C., 1984.
- Christchurch City Council, (1992) *Christchurch City Council Annual Report 1992*, Christchurch City Council, Christchurch.

- Christchurch City Council, (1993) *Christchurch City Council Annual Report 1993*, Christchurch City Council, Christchurch, 22 December.
- Christchurch City Council, (1994a) *Christchurch City Council Annual Report 1994*, Christchurch City Council, Christchurch, 23 December.
- Christchurch City Council, (1994b) *Christchurch City Council 1994/95 Annual Plan*, Christchurch City Council, Christchurch, 25 August.
- Christchurch City Council, (1995) *Christchurch City Council Annual Plan 1995-96*, Christchurch City Council, Christchurch, 17 August.
- "Cities of Potholes and Playgrounds", Anonymous, (1992) *Financial World*, Vol. 161, (4), February 18, pp. 54, 58.
- Cooper, K.J., (1993) "Public Sector Valuations", *New Zealand Valuers' Journal*, December, pp. 11-18.
- Cooper, K.J., (1994) "Valuation Techniques and Problems", *Infrastructural Assets Forum*, Continuing Education Course Paper No. 439, New Zealand Society of Accountants & Victoria University of Wellington, November, Wellington.
- Currie, B., (1987) "Accounting for Infrastructure Assets", *Public Finance and Accountancy*, 8 May, pp. 7-10.
- Dane, F.C., (1990) *Research Methods*, Brooks/Cole Publishing Company, California.
- Davin, T.M., (1993) "Accounting for Infrastructure Assets in Local Government", Discussion Paper, Porirua City Council, Porirua, Unpublished, October.
- Deloitte Touche Tohmatsu, (1995a) "Identifying Infrastructural Assets", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Deloitte Touche Tohmatsu, (1995b) "Accounting Framework for Infrastructural Assets", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Deloitte Touche Tohmatsu, (1995c) "Renewal Accounting", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Dewing, A.S., (1953) *The Financial Policy of Corporations*, 5th ed., Vol. 1, The Ronald Press Company, New York.
- Dixon, K., (1988) "Depreciation in Non-Profit Organisations", *Public Finance and Accountancy*, 12 February, pp. 9-10.
- Drebin, A.R., (1979) "Governmental vs. Commercial Accounting: The Issues," *Governmental Finance*, Vol. 8, November, pp. 3-8.
- Duncan, R., (1995) "Accounting for Infrastructure Assets", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Dunedin City Council, (1992) *Dunedin City Council Annual Report 1991-1992*, Dunedin City Council, Dunedin.

- Dunedin City Council, (1993) *Dunedin City Council Annual Report 1993*, Dunedin City Council, Dunedin.
- Dunedin City Council, (1994) *Dunedin City Council Annual Report, Year Ended 30th June 1994*, Dunedin City Council, Dunedin.
- Dunedin City Council, (1995) *Dunedin City Council Annual Plan 1995/96*, Draft, Dunedin City Council, Dunedin.
- Dyke, J., (1992) *Current Cost Asset Valuation: Methodology*, Research Report No. 39, Published for the Urban Water Research Association of Australia by the Melbourne and Metropolitan Board of Works, Melbourne, February.
- Edwards, J.R., (1986) "Depreciation and Fixed Asset Valuation in British Railway Company Accounts to 1911", *Accounting & Business Research*, Vol. 16, (63), Summer, pp. 251-263.
- Emory, W.C., and D.R. Cooper, (1991) *Business Research Methods*, 4th ed., Richard D. Irwin Inc., Homewood, Illinois.
- Ernst & Young, (1994) *Rationale for Financial Performance Measures in the Electricity Information Disclosure Regime*, A Report to Energy Policy Group, Energy and Resources Division, Ministry of Commerce, Wellington, August.
- Fielding, J., (1993) "Coding and Managing Data", Chapter 11, in Gilbert, N. (ed.), *Researching in Social Life*, SAGE Publications, Inc., London.
- Flutter, J., (1991) "Asset Replacement and Maintenance: The Maintenance Backlog," in *Asset Management in the Public Sector*, Proceedings of the National Conference-Managing Australia's Assets, Lakeside Hotel, Canberra, 16-17 July, 1990, published in the *Canberra Bulletin of Public Administration*, No. 65, Royal Institute of Public Administration (ACT Division), Canberra.
- Fountain, J.R., (1987) "Examining Accounting and Financial Reporting for Capital Assets of Governmental Entities", *The Government Accountants Journal*, Vol. 36, (3), Fall, pp. 54-58.
- Fowler, Jr., F.J., (1990) *Standardized Survey Interviewing: Minimizing Interviewer-Related Error*, Applied Social Research Methods Series, Vol. 18, SAGE Publications, Inc., Newberry Park, California.
- Fowler, Jr., F.J., (1993) *Survey Research Methods*, Applied Social Research Methods Series, Volume 1, 2nd ed., SAGE Publications, Inc., Newberry Park, California.
- Gavron, H., (1966) *The Captive Wife*, Routledge & Kegan Paul, London, in Bell, J., (1987) "Planning and Conducting Interviews", Chapter 8, in *Doing Your Research Project: A Guide for First-Time Researchers in Education and Social Sciences*, Open University Press, Milton Keynes, England.
- Glaser, B.G., and A.L. Strauss, (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine, Chicago, in Bryman, A., and R.G. Burgess (eds.), (1994) *Analyzing Qualitative Data*, Routledge, London.

- Goldberg, L., (1960) *Concepts of Depreciation*, The Law Book Company of Australia, Melbourne.
- Gourvish, T.R., (1970) "Captain Mark Huish: A Pioneer in the Development of Railway Management", *Business History*, Vol. 22, No. 1, pp. 46-58.
- Governmental Accounting Standards Board (GASB), (1987a) *Accounting and Financial Reporting for Capital Assets of Governmental Entities*, Discussion Memorandum, No. 039, Governmental Accounting Standards Board of the Financial Accounting Foundation, Stamford, Connecticut, August 31.
- Governmental Accounting Standards Board (GASB), (1987b) *Concepts Statement No. 1: Objectives of Financial Reporting*, No. 37, Governmental Accounting Standards Board of the Financial Accounting Foundation, Stamford, Connecticut, May.
- Governmental Accounting Standards Board, (1995) *Governmental Financial Reporting Model: Core Financial Statements*, Preliminary Views of the Governmental Accounting Standards Board, No.123-C, Governmental Accounting Standards Board of the Financial Accounting Foundation, Norwalk, Connecticut, June 30.
- Griggs, S., (1987) "Analysing Qualitative Data", *Journal of the Market Research Society*, Vol. 29, (1), pp. 15-34.
- Grossman, D.A., (1980) "The Infrastructure Blues: A Tale of New York and Other Cities", *Governmental Finance*, Vol. 9, June, pp. 9-13.
- Hall, S.G., (1995) *Asset Management Planning: Watercare Services Ltd – Case Study*, Watercare Services Ltd, Auckland, March.
- Hamilton City Council, (1992) *Hamilton City Council – Report to the Public on Performance 1991-1992*, Hamilton City Council, Hamilton.
- Hamilton City Council, (1993) *Hamilton City Council – Annual Report on Performance 1992-93*, Hamilton City Council, Hamilton.
- Hamilton City Council, (1994) *Hamilton City Council Annual Report 1994*, Hamilton City Council, Hamilton.
- Hamilton City Council, (1995a) *Hamilton City Council – Report to the Public on Plans 1995-1996*, Hamilton City Council, Hamilton.
- Hamilton City Council, (1995b) *Hamilton City Council Annual Report 1995*, Hamilton City Council, Hamilton.
- Hanke, J., A. Reitsch, and J.P. Dickson, (1980) *Statistical Decision Models for Management*, Allyn and Bacon, Inc., Boston, Massachusetts.
- Hay, D., (1994) "Accounting for Infrastructural Assets", *Chartered Accountants Journal*, Vol. 73, (6), July, pp. 35-39.
- Henke, E.O., (1987) "Governmental Financial Statements – Generational Equity Reporting", *Government Accountants Journal*, Vol. 36, (1), pp. 18-22.

- Herzlinger, R.E., and D. Nitterhouse, (1994) *Financial Accounting and Managerial Control in Nonprofit Organizations*, South-Western Publishing Co., Cincinnati, Ohio.
- Hoggett, J.R., and L. Edwards (1996) *Accounting in Australia*, 3rd ed., John Wiley & Sons, Milton, Queensland.
- Horngren, C.T., W.T., Harrison, Jr., P.J. Best, D.J. Fraser, and H.Y. Izan, (1992) *Accounting*, Prentice Hall, Sydney.
- Horsley, G.J., (1993) "Introduction to Asset Valuation Standards", *New Zealand Valuers' Journal*, December, pp. 10-11.
- Hoskin, P., (1994) "New System 'innovative and unique' – Elwood", *New Zealand Local Government*, February, pp. 7-8.
- Hughs, J.W., (1994) "Accounting for Maintenance Costs on Governmental Infrastructures", in Buschor, E., and K. Schedler (eds.), *Perspectives on Performance Measurement and Public Sector Accounting*, Paul Haupt Publishers, Berne.
- Hyman, W.A., R.M. Alfelor, and J.A. Allen, (1993) *Road Maintenance*, Research Report, Service Efforts and Accomplishments Reporting: Its Time Has Come, Governmental Accounting Standards Board, Norwalk, Connecticut, February.
- Industry Commission, (1992) *Water Resources and Waste Water Disposal*, Final Report, No. 26, Belconnen, Australian Capital Territory, Australia, 17 July.
- Institute of Chartered Accountants in England and Wales (ICAEW), (1992) "Review for Major Practical Problems of SSAP 12", Technical Release, FRAG 2/92, in Simpkins, K., and G. Jensen, (1995a) *Accounting for Infrastructure Assets: Loss of Service Potential*, Discussion Paper (Draft), Accounting and Auditing Policy Group, Office of the Controller and Auditor-General, Wellington.
- International Federation of Accountants (IFAC), Public Sector Committee, (1994) *Proposed Study Definition and Recognition of Assets*, IFAC Public sector Committee, New York, in Simpkins, K., and G. Jensen, (1995a) *Accounting for Infrastructure Assets: Loss of Service Potential*, Discussion Paper (Draft), Accounting and Auditing Policy Group, Office of the Controller and Auditor-General, Wellington.
- James, G., (1993) "Asset Management Plans: An Overview," Paper for the Society of Local Government Managers Seminar on Strategic Financial Planning, Asset Management Plans and Taxation Issues, April, in Davin, T.M., (1993) "Accounting for Infrastructure Assets in Local Government", Discussion Paper, Porirua City Council, Porirua, Unpublished, October.
- James, G., (1994) "Asset Management Plans", Manager: Services, Waimakariri District Council, in SOLGM Working Party on Infrastructure and Heritage Assets, *Accounting for Infrastructural Assets in Local Government*, Unpublished, October, Attachment 1.
- Jensen, G., (1996) "Accounting for Infrastructure Assets", *Chartered Accountants Journal*, Vol. 75, (7), August, pp. 63-66.
- Joint Economic Committee of Congress, (1984) *Hard Choices: A Report on the Increasing Gap between America's Infrastructure Needs and Our Ability to Pay for Them*, Congress of the United States, Government Printing Office, Washington D.C.

- Jones, R.H., (1985) "Accruals Accounting in U.K. Local Government: A Historical Context for Continuing Controversies", *Financial Accountability & Management*, Vol. 1, (2), Winter, pp. 145-160.
- Kearney, B., and T. Davin, (1994) "Case Study Two: Roothing", *Infrastructural Assets Forum*, Continuing Education Course Paper No. 439, New Zealand Society of Accountants & Victoria University of Wellington, November, Wellington.
- Lapsley, I., (1980) "Towards Public Sector Maintenance", *Public Finance and Accountancy*, October, pp. 27-28.
- Lapsley, I., (1986) "Capital Asset Accounting in UK Non-Trading Organisations", *Financial Accountability & Management*, Vol. 2, (4), Winter, pp. 273-294.
- Law, G., (1992) "Water Industry Accounting", *Local Authority Engineering in New Zealand*, Vol. 8, (4), December, pp. 25, 27.
- Lewis, D., (1992) *Accounting for Infrastructural Assets*, Discussion Document, North Shore City Council, Auckland, December.
- Littleton, A.C., (1933) *Accounting Evolution to 1900*, American Institute Publishing Co. Inc., Reissued by Russell & Russell, New York, 1966.
- Local Government Group, (1994) *Directory of Local Government: Regional Councils, Territorial Authorities, Community Boards*, Department of Internal Affairs, Wellington, September.
- Local Government Law Reform Bill 1994.
- London Economics, (1992) "International Experience of Private Provision of Water, Sewerage and Draining Services", Report to the Industry Commission, London, June, in Industry Commission, (1992) *Water Resources and Waste Water Disposal*, Final Report, No. 26, Belconnen, Australian Capital Territory, Australia, 17 July.
- Luder, K., (1991) "Valuation of Assets in Government", *Paper presented to the 3rd Conference of the Public Sector Committee of the Federation of des Experts Comptables Europeens in Lisbon, Portugal*, October.
- Madsen, D., (1992) *Successful Dissertations and Theses*, 2nd ed., Jossey-Bass Publishers, San Francisco.
- Manukau City Council, (1992) *Manukau City Council Annual Report for the Year Ended 30 June 1992*, Manukau City Council, Manukau City, Auckland.
- Manukau City Council, (1993a) *Manukau City Council 1993/94 Annual Plan*, Manukau City Council, Manukau City, Auckland.
- Manukau City Council, (1993b) *Manukau City Council Annual Report for the Year Ended 30 June 1993*, Manukau City Council, Manukau City, Auckland.
- Manukau City Council, (1994a) *Manukau City Council 1994/95 Annual Plan*, Manukau City Council, Manukau City, Auckland.
- Manukau City Council, (1994b) *Manukau City Council Annual Report for the Year Ended 30 June 1994*, Manukau City Council, Manukau City, Auckland.

- Manukau City Council, (1995) *Manukau City Council Annual Report for the Year Ended 30 June 1995*, Manukau City Council, Manukau City, Auckland.
- Matheson, E., (1893) *The Depreciation of Factories, Mines and Industrial Undertakings and Their Valuation*, 2nd ed., E. & F.N. Spon, London, Reprinted by Arno Press Inc., New York, 1976.
- Mautz, R.K., (1981) "Financial Reporting: Should Government Emulate Business?", *Journal of Accountancy*, August, pp. 53-60.
- Mautz, R.K., (1988) "Monuments, Mistakes, and Opportunities", *Accounting Horizons*, June, pp. 123-128.
- May, G.O., (1936) *Twenty Five Years of Accounting Responsibility, 1911-1936*, American Institute Publishing Company, Vol. 2, New York, in Brief, R.P., (1965) "Nineteenth Century Accounting Error", *Journal of Accounting Research*, Vol. 3, pp. 12-31.
- McCracken, G., (1988) *The Long Interview*, Qualitative Research Methods, Vol. 13, SAGE Publications, Inc., Newberry Park, California.
- McCulloch, B.W., and I. Ball, (1992) "Accounting in the Context of Public Sector Management Reform", *Financial Accountability & Management*, Vol. 8, No. 1, Spring, pp. 7-12.
- Merriam, S.B., (1990) "Conducting Effective Interviews", Chapter 5, in *Case Study Research in Education: A Qualitative Approach*, Jossey-Bass Publishers, San Francisco.
- Micallef, F., P. Sutcliffe, and P. Doughty, (1994) *Financial Reporting by Governments*, Australian Accounting Research Foundation, Discussion Paper No. 21, November, Caulfield, Victoria, Australia.
- Miles, M.B., and A.M. Huberman, (1984) *Qualitative Data Analysis: A Sourcebook of New Methods*, SAGE Publications, Inc., Beverley Hills, California.
- Miller, M.C., and M. Atiqul Islam, (1988) *The Definition and Recognition of Assets: Accounting Theory Monograph No. 7*, Australian Accounting Research Foundation, Victoria, Australia.
- Ministry of Commerce, (1994a) *Guideline for Renewal Accounting of Infrastructure Assets for Performance Measurement Derivation*, Energy Policy Group, Energy & Resources Division, Ministry of Commerce, Wellington.
- Ministry of Commerce, (1994b) *Questions and Answers on Financial Performance Measures, Optimised Deprival Valuations and Avoidance of Double Counting of Asset-Related Expenses*, Energy Policy Group, Energy and Resources Division, Ministry of Commerce, Wellington, August.
- Ministry of Commerce, (1994c) *Electricity Information Disclosure Adjustments to Financial Statements for Performance Measures*, Energy Policy Group, Energy & Resources Division, Ministry of Commerce, Wellington, August.
- Mitchell, J.C., (1983) "Case and Situation Analysis", *The Sociological Review*, Vol. 31, (2), pp. 187-211.

- Mitchell, L., (1993) "Infrastructural Assets – The Vexed Question", *Local Government Bulletin*, May, pp. 1-4.
- Most, K.S., (1982) *Accounting Theory*, 2nd ed., Grid Publishing, Inc., Colombus, Ohio.
- Musgrave, R.A., and P.B. Musgrave, (1984) *Public Finance in Theory and Practice*, 4th ed., McGraw-Hill Book Company, New York.
- National Council on Governmental Accounting (NCGA), (1979) *Governmental Accounting and Financial Reporting Principles*, Statement 1, Municipal Finance Officers Association, Chicago, in van Daniker, R.P., and V. Kwaitkowski, (1986) *Infrastructure Assets: An Assessment of User Needs and Recommendations for Financial Reporting*, Research Report, Governmental Accounting Standards Board, Stamford, Connecticut.
- New South Wales Treasury (NSW), (1989) *Accounting Guidelines for Reporting Physical Assets in the Budget Sector*, New South Wales Treasury, Sydney, November.
- New Zealand Business Roundtable, (1995) *Local Government in New Zealand: An Overview of Economic and Financial Issues*, New Zealand Business Roundtable, Wellington, January.
- New Zealand Society of Accountants (NZSA), (1984) *Statement of Standard Accounting Practice SSAP-3: Accounting for Depreciation*, New Zealand Society of Accountants, Wellington, October.
- New Zealand Society of Accountants (NZSA), (1987) *Statement of Public Sector Accounting Concepts No.1*, New Zealand Society of Accountants, Wellington, July.
- New Zealand Society of Accountants (NZSA), (1990) *Defining and Reporting Community Assets*, Exposure Draft of Technical Guidance Bulletin No. 4 (ED/TGB-4), Public Sector Accounting Committee, New Zealand Society of Accountants, Wellington, June.
- New Zealand Society of Accountants (NZSA), (1991) *Statement of Standard Accounting Practice SSAP-28: Accounting for Fixed Assets*, New Zealand Society of Accountants, Wellington, July.
- New Zealand Society of Accountants (NZSA), (1992a) "Press Announcement: Public Sector Accounting Guidance", *Accountants' Journal*, April, p. 68.
- New Zealand Society of Accountants (NZSA), (1992b) *Proposed Framework for Financial Reporting in New Zealand*, Issued by the Accounting Research and Standards Board, New Zealand Society of Accountants, Wellington.
- New Zealand Society of Accountants (NZSA), (1992c) "Public Sector Accounting Guidance: Application of SSAP-28: Accounting for Fixed Assets", in *New Zealand Society of Accountants Members' Handbook*, Vol. 1, New Zealand Society of Accountants, Wellington, 31 March, 2-302.1.
- New Zealand Society of Accountants (NZSA), (1993) "Statement of Concepts for General Purpose Financial Reporting", *Accountants' Journal*, August, pp. 79-85.
- New Zealand Society of Accountants (NZSA), (1994) "FRS-2: Presentation of Financial Reports", *Chartered Accountants Journal*, Vol. 73, (7), August, pp. 80-87.

- New Zealand Society of Accountants (NZSA), (1995) "Revision Programme Update", *Chartered Accountants Journal*, Vol. 74, (3), April, pp. 49-50.
- New Zealand Society of Accountants (NZSA), (1996) "Functions of Accounting & Professional Standards Department", *Chartered Accountants Journal*, Vol. 75, (4), May, pp. 63-64.
- Nikolai, L.A., and J.D. Bazley, (1988) *Intermediate Accounting*, 4th ed., PWS-KENT Publishing Company, Boston.
- North Shore City Council, (1992) *North Shore City Council Annual Plan 1992-1993*, North Shore City Council, Takapuna, North Shore City, Auckland.
- North Shore City Council, (1993) *North Shore City Council Annual Report 1992/93*, North Shore City Council, Takapuna, North Shore City, Auckland.
- North Shore City Council, (1994) *North Shore City Council Annual Report 1993/94*, North Shore City Council, Takapuna, North Shore City, Auckland.
- North Shore City Council, (1995a) *North Shore City Council Annual Plan 1995/96*, North Shore City Council, Takapuna, North Shore City, Auckland.
- North Shore City Council, (1995b) *North Shore City Council Annual Report 1994/95*, North Shore City Council, Takapuna, North Shore City, Auckland.
- Notley, C., (1996) "A New Era", *Chartered Accountants Journal*, Vol. 75, (8), July, p. 1.
- Office of Water Services (OFWAT), (1992) *Guidelines for Accounting for Current Costs*, Regulatory Accounting Guideline Number 1.02 (RAG 1.02), Birmingham, United Kingdom, May.
- Office of Water Services (OFWAT), (1993a) *The Long Range Normative Charge for Infrastructure Renewals*, Paper sent to the Regulatory Directors of all Water and Sewerage Companies and Water Only Companies, Birmingham, United Kingdom, RD7/93, 9 June.
- Office of Water Services (OFWAT), (1993b) "Infrastructure Renewals Charge", in Chapter C7, Information for Financial Projections, *AMP2 Manual*, Birmingham, United Kingdom, Document C7-1, November.
- Pallot, J., (1987) "Are Public Sector Assets Different?", *Accountants' Journal*, May, pp. 41-45.
- Pallot, J., (1988) "Infrastructure Assets as a Concept in Government Accounting", *Proceedings of The Accounting Association of Australia and New Zealand Annual Conference*, University House, Canberra, 28-31 August.
- Pallot, J., (1989) "Valuing Public Sector Assets", in *Managing Resources for the New Public Sector*, Papers from the 1989 Public Sector Convention, October, Wellington: New Zealand Society of Accountants, pp. 326-331.
- Pallot, J., (1990a) *Community Assets in Public Sector Accounting: Conceptual Framework and Definition*, Phd. Dissertation, Victoria University of Wellington, August.

- Pallot, J., (1990b) "The Nature of Public Sector Assets: A Response to Mautz", *Accounting Horizons*, June, pp. 79-85.
- Pallot, J., (1990c) "Public Sector Assets: A Study in Connotative Meaning", in *Papers Presented at the Accounting Association of Australia and New Zealand Annual Conference*, July, Perth.
- Pallot, J., (1992a) "Elements of a Theoretical Framework for Public Sector Accounting", *Accounting, Auditing and Accountability Journal*, Vol. 5, (1), July, pp. 38-59.
- Pallot, J., (1992b) "Local Authority Reporting: Major Advances Made", *Accountants' Journal*, August, pp. 46-49.
- Pallot, J., (1994) "Where From? Where To?", *Infrastructural Assets Forum*, Continuing Education Course Paper No. 439, New Zealand Society of Accountants & Victoria University of Wellington, November, Wellington.
- Pallot, J., (1995) "Infrastructure Accounting for Local Authorities: Technical Management and Political Context", Paper prepared for the annual *AAANZ Conference*, La Trobe University, Melbourne, Australia, 9-12 July.
- Palmer, K.A., (1993) *Local Government Law in New Zealand*, 2nd ed., The Law Book Company Limited, Sydney.
- Parkes, J., (1989) "Local Authority Capital Accounting – Towards Reform", *Financial Accountability & Management*, Vol. 5, (2), Summer, pp. 107-118.
- Patten, D.M., and J.R. Wambsganss, (1991) "Accounting for Fixed Assets in a Nonprofit Environment: A Recommendation", *Government Accountants Journal*, Vol. 40, Fall, pp. 44-47.
- Paul, J., (1992) "Valuation of Infrastructural and Heritage Assets of Public Sector Entities", in *Papers from the 1992 Public Sector Convention*, New Zealand Society of Accountants, Wellington, pp. 565-588.
- Peirson, G., and A. Ramsay, (1994) *Depreciation of Non-Current Assets*, Discussion Paper No. 20, Australian Accounting Research Foundation, Caulfield, Victoria, October.
- Perrin, J.R., (1979) "Accounting for Depreciation in the Public Sector", In *Papers presented at the 94th Annual Conference of the Chartered Institute of Public Finance and Accountancy*, Chartered Institute of Public Finance and Accountancy, United Kingdom, pp. 37-44.
- Perrin, J., (1984) "Accounting for Public Sector Assets", in Hopwood, A., and C. Tomkins (eds.), *Issues in Public Sector Accounting*, Phillip Allan Publishers Ltd, Oxford.
- Pick, J., (1970) "Concepts of Depreciation – Business Enterprises", *The New York Certified Public Accountant*, Vol. 40, May, pp. 369-380.
- Pollins, H., (1956) "Aspects of Railway Accounting Before 1868", in Littleton, A.C., and B.S. Yamey, (eds.), *Studies in the History of Accounting*, Sweet & Maxwell Ltd, London, pp. 332-355.

- Pollins, H., (1957) "Railway Auditing – A Report of 1867", *Accounting Research*, Vol. 8, pp. 14-22.
- Price Waterhouse, (1989) *Infrastructure Accounting*, Prepared by Price Waterhouse on behalf of the Water Services Association, United Kingdom, November.
- "Propping up America: The Critical Need for Infrastructure Improvements", Anonymous, (1994) *Cost Engineering*, Vol. 36, (10), October, pp. 10-13.
- Rae, J., (1992) "Valuation of Infrastructural and Heritage Assets", in *Papers from the 1992 Public Sector Convention*, New Zealand Society of Accountants, Wellington, pp. 565-588.
- Reid, G.R., (1983) *An Analysis of the Role of Depreciation Accounting in Municipal Enterprises in Relation to Management Financial Policies*, Phd. Dissertation, University of Missouri-Columbia.
- Richardson, S.A., B.S. Dohrenwend, and D. Klein (1965) *Interviewing: Its Forms and Functions*, Basic Books, Inc., New York.
- Riley, J., (1990) *Getting the Most From Your Data: A Handbook of Practical Ideas on How to Analyse Qualitative Data*, Technical and Educational Services Ltd, Bristol, United Kingdom.
- Rowles, T.R., (1991) "Accounting for Infrastructure and Heritage Assets", *Charter*, July, pp. 48-50, 53.
- Rowles, T.R., (1992) *Financial Reporting of Infrastructure and Heritage Assets by Public Sector Entities*, Discussion Paper No. 17, Australian Accounting Research Foundation, Victoria, Australia.
- Rutherford, B.A., (1983) *Financial Reporting in the Public Sector*, Butterworths, London.
- Scapens, R.W., (1990) "Researching Management Accounting Practice: The Role of Case Study Methods", *British Accounting Review*, Vol. 20, pp. 259-281.
- Seed, P., and G. Horsley, (1994) "Issues in Valuing Infrastructural Assets", *Infrastructural Assets Forum*, Continuing Education Course Paper No. 439, New Zealand Society of Accountants & Victoria University of Wellington, November, Wellington.
- Shand, D., (1994) "Financial Management Reforms in Government: An International Perspective", *Paper presented to the International Conference on Financial Management and Accountability in the Public Sector*, Delhi, 8 February.
- Simpkins, K., (1994) "Financial Reporting Act 1993: Key Requirements", *Accountants' Journal*, April, pp. 15-17.
- Simpkins, K., and G. Jensen, (1995a) *Accounting for Infrastructure Assets: Loss of Service Potential*, Discussion Paper (Draft), Accounting and Auditing Policy Group, Office of the Controller and Auditor-General, Wellington.
- Simpkins, K., and G. Jensen, (1995b) "Accounting for Infrastructure", *Chartered Accountants Journal*, Vol. 74, (9), October, p. 20.

- Smith, B., (1995) "Managing Infrastructural Assets: Accountability and Audit Requirements", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Smithies, E.B., (1993) "Infrastructural Asset Valuation", *New Zealand Valuers' Journal*, December, pp. 19-24.
- Society of Local Government Managers (SOLGM), (1992) *Guidelines for Good Accounting Practice in Local Government and Presentation of External Financial Reports*, New Zealand Society of Local Government Managers, Wellington, June.
- Society of Local Government Managers (SOLGM), Working Party on Infrastructure and Heritage Assets, (1994a) *Accounting for Infrastructural Assets in Local Government*, Unpublished, October.
- Society of Local Government Managers (SOLGM), Working Party on Infrastructure and Heritage Assets, (1994b) *Accounting for Heritage Assets in Local Government*, Asset Management and Financial Seminar, Wellington, Unpublished, 6 March.
- Statistics New Zealand, (1996) *New Zealand Official Yearbook 1996*, 99th ed., Statistics New Zealand, Wellington, May.
- Stuart, M., (1992) "Practical Problems in Asset Accounting and Valuation for the Public Sector", in *Papers from the 1992 Public Sector Convention*, New Zealand Society of Accountants, Wellington, pp. 595-603.
- Sutcliffe, P., (1985) *Financial Reporting in the Public Sector – A Framework for Analysis and Identification of Issues*, Accounting Theory Monograph No. 5, Australian Accounting Research Foundation, Melbourne, Australia.
- Sutcliffe, P., F. Micallef, and L.D. Parker, (1991) *Financial Reporting by Government Departments*, Discussion Paper No. 16, Australian Accounting Research Foundation, Caulfield, Victoria.
- Taylor, G., (1995) "Defining the Infrastructure Asset", paper presented at: *Managing Infrastructure Assets Conference*, AIC Conference, Wellington, 13-14 March.
- Taylor, N.V., (1989) "Local Authority Accounting – The Development of a Conceptual Framework", *Financial Accountability & Management*, Vol. 5, No.1, Spring, pp. 19-38.
- Tesch, R., (1990) *Qualitative Research: Analysis Types and Software Tools*, The Falmer Press, London.
- The Hutt City Council, (1992) *The Hutt City Council 1991/1992 Annual Report*, The Hutt City Council, Lower Hutt, 28 September.
- The Hutt City Council, (1993a) *The Hutt City Council 1993/94 Annual Plan*, The Hutt City Council, Lower Hutt, 12 July.
- The Hutt City Council, (1993b) *The Hutt City Council 1992/93 Annual Report*, The Hutt City Council, Lower Hutt, 28 September.

- The Hutt City Council, (1994) *The Hutt City Council 1993/94 Annual Report*, The Hutt City Council, Lower Hutt, 27 September.
- The Hutt City Council, (1995) *The Hutt City Council 1994/95 Annual Report*, The Hutt City Council, Lower Hutt.
- Tonkin, B.C., (1991) "The Nation's Infrastructure: This Generation's Problem", in *Asset Management in the Public Sector*, Proceedings of the National Conference—Managing Australia's Assets, Lakeside Hotel, Canberra, 16-17 July, 1990, published in the *Canberra Bulletin of Public Administration*, No. 65, Royal Institute of Public Administration (ACT Division), Canberra.
- Transit New Zealand, (undated but obtained by the author in September 1995) *Transit New Zealand Profile* (pamphlet), Transit New Zealand, Wellington.
- Troxel, E., (1947) "Depreciation", Chapter 15, *Economics of Public Utilities*, Rinehart & Company, Inc., New York.
- Van Daniker, R.P., and V. Kwaitkowski, (1986) *Infrastructure Assets: An Assessment of User Needs and Recommendations for Financial Reporting*, Research Report, Governmental Accounting Standards Board, Stamford, Connecticut.
- Van Zijl, T., (1994a) "Current Accounting Issues", *Infrastructural Assets Forum*, Continuing Education Course Paper No. 439, New Zealand Society of Accountants & Victoria University of Wellington, November, Wellington.
- Van Zijl, T., (1994b) "Financial Reporting Regulation", Discussion Paper, Victoria University of Wellington, Wellington, January.
- Vass, R.J., M. Anderson, R. Lewis, and D. Samson, (1990) *Pipeline Assets: Life Cycle Management and Economic Life*, Research Report No. 17, Published for the Urban Water Research Association of Australia by the Melbourne and Metropolitan Board of Works, Melbourne, November.
- Victoria, Department of Management and Budget, (1989) *Recording and Reporting of Non-Current Physical Assets*, Accounting Policy Statement No. 4, Issued by the Comptroller and Auditor-General, Melbourne, October.
- Victoria, Department of the Treasury, (1991) *Recording and Reporting of Non-Current Physical Assets*, Accounting Policy Statement No. 4, August, in Rowles, T.R., (1992) *Financial Reporting of Infrastructure and Heritage Assets by Public Sector Entities*, Discussion Paper No. 17, Australian Accounting Research Foundation, Victoria, Australia, p. 41.
- Waimakariri District Council, (1992) *Waimakariri District Council Annual Report for the Year Ended 30 June 1992*, Waimakariri District Council, Rangiora.
- Waimakariri District Council, (1993) *Waimakariri District Council Annual Report for the Year Ended 30 June 1993*, Waimakariri District Council, Rangiora.
- Waimakariri District Council, (1994) *Waimakariri District Council Annual Report for the Year Ended 30 June 1994*, Waimakariri District Council, Rangiora.

- Waimakariri District Council, (1995) *Waimakariri District Council Annual Plan and Budget for the Year Ended 30 June 1996*, Waimakariri District Council, Rangiora.
- Waitakere City Council, (1993) *Waitakere City Council Annual Report for the Year Ended 30 June 1993*, Waitakere City Council, Waitakere City, Auckland, November.
- Waitakere City Council, (1994) *Waitakere City Council Annual Report for the Year Ended 30 June 1994*, Waitakere City Council, Waitakere City, Auckland.
- Waitakere City Council, (1995) *Waitakere City Council 1995 Annual Report*, For the Year Ended 30 June 1995, Waitakere City Council, Waitakere City, Auckland.
- Watercare Services Ltd, (1993) *Watercare Services Ltd Annual Report 1992/1993*, Watercare Services Ltd, Auckland.
- Watercare Services Ltd, (1994) *Watercare Services Ltd Annual Report 1993/1994*, Watercare Services Ltd, Auckland, September.
- Weisberg, H.F., J.A. Krosnick, and B.D. Bowen, (1989) *An Introduction to Survey Research and Data Analysis*, 2nd ed., Scott, Foresmand and Company, Glenview, Illinois.
- Wellington City Council, (1992) *Wellington City Council Annual Report 1991/92*, Wellington City Council, Wellington.
- Wellington City Council, (1993) *Wellington City Council Annual Report 1992-1993*, Wellington City Council, Wellington.
- Wellington City Council, (1994) *Wellington City Council Annual Report 1993/1994*, Wellington City Council, Wellington.
- Wellington City Council, (1995) *Wellington City Council Annual Plan 1995/96*, Wellington City Council, Wellington.
- Wolcott, H.F., (1990) *Writing up Qualitative Research*, Qualitative Research Method Series, Volume 20, SAGE Publications, Inc., Newberry Park, California.
- Wragg, E.C., (1980) *Conducting and Analysing Interviews*, Rediguide 11, University of Nottingham School of Education, in Bell, J., (1993) "Planning and Conducting Interviews", Chapter 8, *Doing Your Research Project: A Guide for First-Time Researchers in Education and Social Sciences*, 2nd ed., Open University Press, Milton Keynes, England.
- Yin, R.K., (1989) *Case Study Research: Design and Methods*, Applied Social Research Methods Series Volume 5, SAGE Publications, Inc., Newberry Park, California.
- Young, R.P., (1993) "Market Valuation with No Market: Valuing Properties with Little Evidence", *New Zealand Valuers' Journal*, June, pp. 28-35, in Pallot, J., (1995) "Infrastructure Accounting for Local Authorities: Technical Management and Political Context", Paper prepared for the annual *AAANZ Conference*, La Trobe University, Melbourne, Australia, 9-12 July.
- Zabusch, Z., (1992) "Is Your Infrastructure Showing?", *American City & County*, Vol. 109, (9), August, p. 8.

APPENDICES

Appendix 1: Definitions of Infrastructure Assets	226
Appendix 2: SOLGM (1994a) Classification of Infrastructural Asset Networks.....	227
Appendix 3: Asset Management Plans	228
Appendix 4: Distinction Between Maintenance and Capital Expenditure	230
Appendix 5: Renewals Holiday and First Cycle of Renewals	231
Appendix 6: Key Characteristics of an Acceptable Renewal Accounting Approach.....	232
Appendix 7: Aggregate Figures for Infrastructural Assets of Surveyed Local Authorities	233
Appendix 8: Covering Letters and Letters of Confirmation	234
Appendix 9: Schedule of Common Questions Asked During Personal and Telephone Interviews..	237
Appendix 10: Codes Used for Qualitative Data Analysis of Interview Transcripts	240
Appendix 11: Accounting Policies, Asset Information Systems and AMPs of Surveyed Local Authorities.....	241
Appendix 12: Renewal and Depreciation Accounting Policies Adopted by Surveyed Local Authorities.....	243
Appendix 13: Correspondence with the NZSA.....	245

APPENDIX 1: DEFINITIONS OF INFRASTRUCTURE ASSETS²

Source	Definition	Key Characteristics
1. Canadian Institute of Chartered Accountants (CICA, 1989, p. 101)	Public facilities that provide essential services and enhance productive capacity	Provide essential services; enhance productivity
2. Governmental Accounting Standards Board (USA) (GASB, 1987a, p. 2)	Public domain capital assets	Public "domain" not defined
3. Associated General Contractors of America (Cited in Van Daniker & Kwaitkowski, 1986, p. 9)	System of public facilities publicly and privately funded which provide for the delivery of essential services and a sustained standard of living	Provide essential services
4. Governmental Accounting and Financial Reporting Principles (ibid, p. 9)	Public domain or infrastructure general fixed assets . . . assets that are immovable and of value only to government	Public domain assets – immovable
5. Preferred Accounting Practices for State Governments (SGAP USA, ibid, p. 10)	Assets that are immovable and of value only to the government entity	Immovable
6. NSW Treasury (1989, para. 2.2.2)	Includes all non-current assets comprising the public facilities that provide essential services and enhance the productive capacity of the economy	Essential services enhance productive capacity
7. Currie (1987, p. 8)	Major civil engineering works	
8. New Zealand: "Community Assets", (NZSA, 1990, ED/TGB No.4, para. 2)	Community assets/fixed assets of an infrastructure environmental or cultural nature held by a public sector entity	Used by the community at large, non-substitutable and/or non-saleable
	Infrastructure assets provide a social service rather than a commercial service	Large, not capable of subdivision, no determinable market value, constraints on disposal
9. Victorian Treasury: "Operating Assets", (1991, p. 11)	Non-current physical assets which are not heritage assets	Non-current physical assets other than heritage assets

² Source: Table 4.1, p. 41., Rowles, T.R., (1992) *Financial Reporting of Infrastructure and Heritage Assets by Public Sector Entities*, Discussion Paper No. 17, Australian Accounting Research Foundation, Victoria, Australia.

APPENDIX 2: SOLGM (1994a) CLASSIFICATION OF INFRASTRUCTURAL ASSET NETWORKS

Examples of infrastructural assets typically found in New Zealand local government, which are provided in the SOLGM guidelines (*Accounting for Infrastructural Assets in Local Government*, 1994a, p. 3), are as follows:

Infrastructural Asset System (Network)	Component
Roading	Land Pavement Formation Kerb and Channel Footpaths Bridges Signs Lighting Traffic Signals Roundabouts Islands
Water Supply	Land Reticulation Pump Station Buildings Pumps Control Stations (Telemetry) Bores Treatment Stations Water Rights Dams/Reservoirs
Sewerage and Stormwater Systems	Land Pump Station Buildings Pumps Control Stations (Telemetry) Treatment Plants Water Rights Reticulation
Flood Control	Land Stopbanks Floodgates Culverts and Bridges Soil Conservation Plantings Flood Retention Dams Bank Protection Works Control Stations (Telemetry)
Erosion Control	Land Seawalls Breakwaters
Land Drainage	Land Pump Station Buildings Pumps Drainage Channels

APPENDIX 3: ASSET MANAGEMENT PLANS

A typical asset management plan might include the following contents (for a more detailed discussion see James (1994)):³

Rationale for Ownership (outline of the organisation's reasons for owning the assets).

Description of the Assets (details all relevant aspects of the asset as it currently exists):

- Physical Parameters (e.g. age, length, capacity, size, type of material, area, location).
- Asset Capacity (ideally, both original design capacity of the asset, and actual capacity from in-service monitoring, should be detailed).
- Asset Condition.
- Asset Value (current valuation(s), together with information such as historical trends and methods).

Maintenance Plans (routine and recurring work of a basic nature, to keep the asset operational; does not include replacement or major refurbishment):

- Defined Standards of Asset Condition (or "desired level of service").
- Maintenance History (outline of past maintenance efforts and practices).
- Maintenance Programmes (detailed listing of annual programme of maintenance).
- Maintenance Budgets (current annual maintenance budgets and detailed forward projections for at least three years are desirable).
- Assessment of Deferred Maintenance.
- Maintenance Funding Strategy (AMPs should be clearly linked to strategic financial plans).
- Maintenance Support and Training Needs (to ensure that the specific support needs for asset maintenance are able to be met and a trained workforce is available to complete tasks within budgeted levels).

Replacement Plans (replacement involves renewal and refurbishment of a significant proportion of the asset to "as new" condition):

- Identification of Assets to be Replaced.
- End-of-Life Projection (assessment of economic life of asset components is critical to planning).
- Replacement Programme (identifies necessary replacement each year to achieve optimal costs).
- Replacement Costs (assessment of options and identifies annual impact of replacements).
- Assessment of Deferred Replacements (their cost should be reflected in the asset balance sheet).
- A Replacement Funding Strategy (linked with financial plans and should identify revenue sources).
- Replacement Support and Training Needs (operational aspects of replacement work identified).

³ Source: pp. 2-9, James, G., (1994) "Asset Management Plans", Manager: Services, Waimakariri District Council, in SOLGM Working Party on Infrastructure and Heritage Assets, *Accounting for Infrastructural Assets in Local Government*, Unpublished, October, Attachment 1.

Acquisition Plans (primary focus is on minimising whole-of-life costs):

- Forecast of Acquisition Needs (strong links with resource management plans, such as District and Regional Plans).
- Forecast of Acquisition Costs (emphasis on determining life-cycle rather than just capital costs).
- Selection Criteria (note: requirements for public consultation should be spelt out together with the consultation processes to be used).
- Specifications (needs to fit the levels of service required and the selection criteria).
- Funding Strategy for Acquisition (needs a firm link with strategic financial plans).

Disposal Plans (examples include: closure and subsequent sale of a road or perhaps a refuse disposal site):

- Forecast of Disposal Timing (based on optimal life predictions from elsewhere in the AMP).
- Disposal Procedures (appropriate provisions for disposal procedures should be identified).
- Disposal Proceeds (estimated value of proceeds and their end destination should be stated).

APPENDIX 4: DISTINCTION BETWEEN MAINTENANCE AND CAPITAL EXPENDITURE

The North Shore City Council distinguishes between maintenance and capital expenditure by dividing maintenance into routine maintenance, major maintenance and capital expenditure as follows:⁴

Routine Maintenance:

Routine maintenance projects can be expected to display some of the following characteristics:

- regular and ongoing annual expenditure necessary to keep the service operating at the required level of service,
- day to day and/or general upkeep works designed to keep the assets operating,
- works which provide for the normal care and attention of the asset including repairs and minor replacements,
- minor response type remedial works, i.e. isolated instances where portions or sections of unit of an asset fail and need immediate repair to make the asset operational again,
- major maintenance projects where the value of the work does not exceed \$5000.

Major Maintenance:

Projects displaying one or more of the following attributes, and where the value of the work exceeds \$5000, can be classified as major maintenance:

- upgrade works which do not increase the capacity of the asset, i.e. works which improve and enhance the assets and restore them to their original size and capacity,
- the replacement component of upgrade works which increase the capacity of the asset, i.e. that portion of the work which restores the assets to their original size and capacity,
- restoration or replacement of portions of existing worn-out asset networks which do not increase the capacity of the asset, i.e. works which restore the assets to their original size and capacity,
- the replacement component of the restoration of portions of existing worn-out asset networks which increase the capacity or significantly extend the useful economic life of the asset,
- reconstruction works involving realignments, regrading and widening improvements,
- renewal and/or renovation of existing assets, i.e. restoring the assets to a new or fresh condition.

Capital

Projects displaying one or more of the following characteristics and where the value of the work exceeds \$1000 are deemed to be of a capital nature and should be included in the Capital Expenditure Statement:

- construction works which create an asset that did not previously exist in any shape or form,
- expenditure which purchases or creates an asset or in any way improves an asset beyond its original design,
- upgrade works which increase the capacity of the asset, restoration or replacement of portions of existing worn-out asset networks which increase the capacity of the asset, construction works designed to produce an improvement in the standard and operation of the asset beyond its capacity.

⁴ Source: Appendix A, Lewis, D., (1992) *Accounting for Infrastructural Assets*, Discussion Document, North Shore City Council, Auckland, December.

APPENDIX 5: RENEWALS HOLIDAY AND FIRST CYCLE OF RENEWALS

Below is an illustration of how the renewable elements might be accounted for during the renewals holiday and the first cycle of renewals.⁵

In the water industry there might be a 1,000 mile underground mains network whose current replacement cost is £100m comprising £20m in respect of non-replaceable elements (such as initial design work, excavation, etc) and £80m in respect of renewable elements (for example, pipework).

Engineering calculations show, say, that all pipework must be renewed either through replacement or relining at a point between the 50th and 150th year, or every 100 years on average. In this example, the first 50 years of the system life represents its 'maintenance-free period'. Thereafter, the renewals programme renews 10 miles of mains per annum – at a cost of £0.8m – to maintain the system in its steady state.

The value of the 'maintenance-free period' is the sum of renewals expenditure which would otherwise have been incurred over this period, ie £40m. Amortising this over the 50 years results in a charge for consumption cost of £0.8m per annum and a balance sheet carrying value at the end of the period of £60m (£20m for non-replaceable elements and £40m for renewable elements).

In the 51st year, the renewals programme renews 10 miles of mains and a renewals based consumption cost is £0.8m. The balance sheet value of the asset is carried forward indefinitely at £60 million. If, alternatively, the system were to be treated as comprising individual replaceable assets, separate accounting records would need to be kept for each of the constituent elements. The pipework would be attributed a 100 year life and the annual depreciation provision would be £0.8m. Maintaining accounting records of individual pipe lengths, retiring old lengths and capitalising new, would be a more arduous accounting task, but the effect would be the same.

In an earlier example concerning the renewal of a railway line, Currie notes that such an approach replaces a detailed asset register with a register of assumptions about the renewals charges for renewable assets. However, he also notes that it will be necessary to keep the engineering information up to date, in price terms, in order to control the engineering works. The projected renewals charge and the equivalent charge made during the renewals holiday might be calculated using the following formula:
$$N * C / Y$$

Where N = the quantity of renewable elements in the system; C = the unit cost of renewable elements (or, more precisely, the unit cost of renewing them); and Y = the number of years in the renewal cycle.

The definition of the beginning and end of the renewals cycle will never be as sharp as the above example assumes, and the renewal process will not run as smoothly in any one section of the infrastructure. However, Currie argues that the expectation must be that the large size and extent of the infrastructure of a major undertaking will smooth out most of the lumpiness.

⁵ Source: p. 10, Currie, B., (1987) "Accounting for Infrastructure Assets", *Public Finance and Accountancy*, 8 May, pp. 7-10.

APPENDIX 6: KEY CHARACTERISTICS OF AN ACCEPTABLE RENEWAL ACCOUNTING APPROACH⁶

1.0 *Introduction*

- 1.1 This appendix summarises the key characteristics which the Office of the Controller and Auditor-General expects from an acceptable form of renewal accounting. An acceptable renewal accounting policy will be one where:

2.0 *Reliability and Consistency*

- 2.1 There is a comprehensive asset management plan which makes it possible to know whether the current level of service potential is being maintained, reduced, or enhanced. The plan should be prepared by a person competent to determine annual infrastructure maintenance requirements. The plan should also be attested by an independent professional engineer who would comment on such things as the reasonableness of the underlying assumptions and planned maintenance expenditures of the plan. The plan must be adopted by the council – in the case of a local body – or other governing body; for example, the Board of Directors.
- 2.2 There is a clear policy as to what counts as maintenance (expenses) and what counts as improvements (increases in assets).
- 2.3 There is consistency in the application of policies (for example, definitions of maintenance and capital expenditure) from year to year. Any changes in accounting policy should be reported in the same way that accounting standards require other accounting policy changes to be reported.

3.0 *Accurate Reporting of Loss of Service Potential and Deferred Maintenance*

- 3.1 Expenditure on maintenance is treated as an expense in lieu of depreciation only in mature networks which have reached a “steady state”. In new networks, or networks with significant new portions, there will be a decline in service potential even though actual maintenance expenditure might not be required at this early stage. In such instances, traditional depreciation accounting is more appropriate.
- 3.2 Any material enhancements of, or reductions in, the system’s service potential are reported. (For example, where maintenance required by the AMP during the year is not performed, the resulting loss of service potential is treated as an expense in the statement of financial performance and reported as a contra-asset in the statement of financial position).
- 3.3 Where there is a major sub-component with a determinable finite life the cost of the sub-component is allocated over its useful life. Expenditure on replacing such a component is capitalised and added to the value of the network and then allocated over the component’s lifetime.
- 3.4 The policy distinguishing between maintenance (expenses) and improvements (increases in assets) ensures that there is no double counting of expenditure.

4.0 *Accurate Reporting of Asset Value*

- 4.1 Triennial valuations of the infrastructure asset consistent with accounting for other fixed assets when using a modified historic cost basis are done.

⁶ Source: Appendix 2, pp. 25-26, in Simpkins, K., and G. Jensen, (1995a) *Accounting for Infrastructure Assets: Loss of Service Potential*, Discussion Paper (Draft), Accounting and Auditing Policy Group, Office of the Controller and Auditor-General, Wellington.

APPENDIX 7: AGGREGATE FIGURES FOR INFRASTRUCTURAL ASSETS OF SURVEYED LOCAL AUTHORITIES

Council/ Local Authority	Population ⁷	Total Assets (\$000) ⁸	Total Infrastructural Assets (\$000)
Auckland City	336 500	2 196 008	1 257 890
Manukau City	243 400	1 266 921	878 265
North Shore City	163 600	733 097	414 092
Waitakere City	147 500	724 299	572 939
Hamilton City	106 700	935 469	506 726
The Hutt City	95 000	552 937	362 986
Wellington City	153 800	1 994 532	840 190
Christchurch City	308 800	2 746 030	1 235 386
Dunedin City	121 100	1 565 889	869 415
Total for 9 Largest Cities	1 676 400	12 715 182	6 937 889
Watercare Services Ltd	Not Applicable	983 161	859 144 ⁹
Waimakariri District	30 700	171 316	141 092
Banks Peninsula District	8 000	91 431	65 519
Grand Total	1 715 100	13 961 090	8 003 644

⁷ Estimated as at 31 March 1995. Source: Statistics New Zealand, (1996) *New Zealand Official Yearbook 1996*, 99th ed., Statistics New Zealand, Wellington, May, pp. 85-86.

⁸ The figures for Total Assets and Total Infrastructural Assets are derived from the 1994 annual reports of each local authority. The figures for Total Assets are based on the consolidated Total Asset figures of each local authority.

⁹ Watercare Services Ltd treats water and wastewater assets as fixed assets. The total above for infrastructural assets includes pipelines, structures – dams, structures – other (includes tanks, tunnels, roads, and reservoirs), and plant and equipment (Watercare Services Ltd, 1994, p. 25).

APPENDIX 8: COVERING LETTERS AND LETTERS OF CONFIRMATION

Typical Covering Letter Sent to Surveyed Local Authorities Requesting Personal Interviews:



Department of Accountancy, Finance and Information Systems University of Canterbury

Private Bag 4800 Christchurch New Zealand 8001

Fax Number : Local (03) 364 2727

International +64-3-364-2727

Email: J.DOYLE@AFIS.CANTERBURY.AC.NZ

Telephone : Local (03) 364 2709

International +64-3-364-2709

[<Interviewee's Name>]
[<Local Authority's Name>]
[<Address>]

14 August 1995

Dear [<Interviewee's Name>]

I am writing a thesis for a Master of Commerce degree in accountancy on the topic of "Renewals Accounting for Infrastructural Assets by Local Authorities". My topic concerns studying the issues related to accounting and managing infrastructural assets, with particular emphasis on renewals accounting in New Zealand local government. To date, this has involved reviewing the theoretical foundations of renewals accounting as discussed in the literature, and drawing comparisons and contrasts with depreciation accounting normally applied to fixed assets.

As part of my research, I aim to survey the views and experiences of key people involved in accounting for and managing infrastructural assets. To do this, I need to talk with a number of people in local government who can provide me with insight into the problems and issues surrounding these assets. This will provide me with valuable information about how renewals accounting is being applied in local government, and also some of the concerns which people involved with the issue have.

This would involve talking with yourself for approximately 30 minutes to 1 hour on issues related to accounting for infrastructural assets and also with another senior manager involved in the management of these assets. I will be in Auckland during the week of 18th to 22nd of September to talk with people in the other three city councils concerning these issues. I hope that you can be available at some time during this period. I am aware of the leadership [<Local Authority's Name>] has shown in this area and also of a paper which you presented at an AIC conference in Wellington during March this year. Consequently, your views on the issue are of great interest to me. Confidentiality will be assured and no person will be specifically identified in the report of my findings. If you wish, I could give you a copy of a summary of the findings and recommendations of my thesis upon completion.

The participation of your Council in these interviews would be greatly appreciated. I will contact you by phone within the next week to see if you are able to meet and talk with me in September.

Yours sincerely

James Doyle

Typical Confirmation Letter Sent to Surveyed Local Authorities:***Department of Accountancy, Finance
and Information Systems
University of Canterbury***

Private Bag 4800 Christchurch New Zealand 8001

Fax Number : Local (03) 364 2727

International +64-3-364-2727

Email: J.DOYLE@AFIS.CANTERBURY.AC.NZ

Telephone : Local (03) 364 2709

International +64-3-364-2709

[<Interviewee's Name>]

[<Local Authority's Name>]

[<Address>]

September 11, 1995

Dear [<Interviewee's Name>]

Thank you for agreeing to meet with me, along with [<Interviewee's Name>], on Monday 18 September at 10.30am. Below is a list of topics that I wish to ask you both questions about concerning infrastructural assets.

Why [<Local Authority's Name>] has adopted a renewals accounting approach for its infrastructural assets

What the mechanics of this approach involve

What the advantages and disadvantages of this approach are

Once again thank you for your cooperation and I look forward to meeting you next Monday.

Yours sincerely

James Doyle

Typical Covering Letter Sent to Councils Requesting Telephone Interviews:



Department of Accountancy, Finance and Information Systems University of Canterbury

Private Bag 4800 Christchurch New Zealand 8001

Fax Number : Local (03) 364 2727

International +64-3-364-2727

Email: J.DOYLE@AFIS.CANTERBURY.AC.NZ

Telephone : Local (03) 364 2709

International +64-3-364-2709

[<Interviewee's Name>]
[<Local Authority's Name>]
[<Address>]

October 10, 1995

Dear [<Interviewee's Name>]

I am writing a thesis for a Master of Commerce degree in accountancy on the topic of "Renewals Accounting for Infrastructural Assets by Local Authorities". My topic concerns studying the issues related to accounting and managing infrastructural assets, with particular emphasis on renewals accounting in New Zealand local government. To date, this has involved reviewing the theoretical foundations of renewals accounting as discussed in the literature, and drawing comparisons and contrasts with depreciation accounting normally applied to fixed assets.

As part of my research, I am surveying the views and experiences of key people involved in accounting for and managing infrastructural assets. I have talked with people in several local authorities in Christchurch and also Auckland's four city councils. This will provide me with valuable information about how renewals accounting is being applied in local government, and also some of the concerns which people involved with the issue have. Because [<Local Authority's Name>] has infrastructural assets, your views concerning these assets and accounting for them are of great interest to me.

Unfortunately, I do not have the resources to see you face to face in person, and are therefore asking if you, or one of your staff who is substantially involved in accounting for these assets, would be willing to talk with me over the phone. This will take approximately 20 - 30 minutes. I can assure your name of confidentiality in the report of my findings, and if you wish, I can give you a copy of a summary of the findings and recommendations of my thesis upon completion.

Below is a list of general topics about which I would wish to ask questions concerning [<Local Authority's Name>]'s infrastructural assets:

Why [<Local Authority's Name>] uses a normal depreciation accounting approach for its infrastructural assets

What the advantages and disadvantages of this approach are

Asset Management Plans

Renewal accounting for infrastructural assets

The participation of your Council would be very much appreciated and would be a valuable contribution to my research. I will contact you by phone within the next few days to see if you would be willing to arrange a time to talk with me concerning the above matters.

Yours sincerely

James Doyle



APPENDIX 9: SCHEDULE OF COMMON QUESTIONS ASKED DURING PERSONAL AND TELEPHONE INTERVIEWS

Typical Questions Asked of All Interviewees Concerning General Issues:

Infrastructural Assets - Definition and Common Features

- How do you define your infrastructural assets?
- How do you distinguish between your infrastructural assets and your normal fixed assets?

Valuation of Infrastructural Assets

- How do you value your infrastructural assets?

Asset Information Systems and Information on Infrastructural Assets

- What information is needed to manage infrastructural assets?
- How well developed are your asset management plans?
- How is the required maintenance on infrastructural assets calculated?

Intergenerational Equity

- When infrastructural assets are talked about, questions of intergenerational equity often arise. How do you think that should be dealt with?

Generally Accepted Accounting Practice and Renewal Accounting for Infrastructural Assets

- Renewal accounting is not generally accepted accounting practice in terms of accounting standards. What do you think about that?

Typical Questions Asked of Respondents in Entities Using Renewal Accounting:

Reasons for Adopting Approach

- [<Local Authority's Name>] has adopted a renewal accounting approach for its infrastructural assets. Why is that?
- Why do you not use traditional/conventional depreciation accounting for these assets?
- What have been the difficulties encountered in adopting this approach?

Advantages/Disadvantages of Approach

- What do you think the advantages are of using a renewal accounting approach for infrastructural assets ?

- What do you think the disadvantages or limitations are, if any, of renewal accounting?

Typical Questions About Components of Renewal Accounting (mechanics of approach):

Indefinite Useful Life (asked of all interviewees)

- Infrastructural assets have been defined in terms of assets which form a network and while individual parts wear out, the system as a whole can have an indefinite life, given continual replacement and refurbishment of component parts takes place.

What do you think is meant by the term 'indefinite life' for these assets ?

Revenue and Capital Expenditure (asked of all interviewees)

- How do you distinguish between what is renewal/maintenance expenditure and capital expenditure?

Provisions for Deferred Maintenance

- How is the provision for deferred maintenance, if any, dealt with?
- Recognition of the amount of deferred maintenance in balance sheet is not a liability and is largely based on a councils intention. This has been criticised as being open to manipulation and regulation of the operating result each year. How do you think that should be dealt with?

Steady State and Factors Affecting Reliable Measures of Losses of Service potential

- Under renewal accounting the cost of maintenance and renewal is claimed to be a good measure of the cost of consumption of service potential where the infrastructural asset is in a steady state. That is, being maintained at a given size. Are [<Local Authority's Name>]'s assets in a steady state?
- Does work need to be done to bring the system up to its steady state or up to desired level of service capacity?
- In determining the annual renewal and replacement expenditure required to maintain the assets at certain level of service capacity, is this likely to be smoothed over several periods?
- Where a system is relatively new, or a new system is constructed, there is not a lot of need for renewal and replacement in the early years of the system's life. How do you think that should be dealt with?

Asset Management Plans (asked of all interviewees)

- How are asset management plans used under the current accounting approach?
- Who is involved in the preparation of these plans?

Typical Questions Asked of Respondents in Entities Using Traditional Depreciation Accounting:

Reasons for Adopting

- [<Local Authority's Name>] uses a depreciation accounting approach for its infrastructural assets. Why is that?

Mechanics of Approach

- How are the annual depreciation rates calculated?
- When charging for depreciation and also maintaining infrastructural assets in perpetuity, there has been criticism that there could be double counting. How is that avoided?

Advantages/Disadvantages of Approach

- What do you think the advantages of using a depreciation approach are?
- What do you think the disadvantages of using a depreciation approach are?

Views About Renewal Accounting

- What do you think about using a renewal accounting approach for infrastructural assets?
- What advantages do you think using renewal accounting has?
- What disadvantages or limitations do you think renewal accounting has?

Typical Questions Asked of Interviewees at Close of Interviews:

- What are your main concerns about infrastructural assets from a management point of view?
- What are your main concerns when accounting for these assets?
- Where do you think accounting for infrastructural assets is likely to head in the future?

APPENDIX 10: CODES USED FOR QUALITATIVE DATA ANALYSIS OF INTERVIEW TRANSCRIPTS

INFRASTRUCTURAL ASSETS	(CODE)	ASSET MANAGEMENT SYSTEMS & AMPS	(CODE)
Definition	DEFN	Asset Management Plans	AMPs
Maintenance in Perpetuity	MNPERP	Level of Service	SERLEV
Indefinite Useful Life	INDEF	PAMS	PAMS
Continual Maintenance	CONMN	RAMM	RAMM
		Asset Information	ASSTINFO
GENERAL TOPICS		Condition Assessment	CONDASS
Local Govt Reforms	LGREF		
Intergenerational Equity	INTGEN		
Future Directions	FUTURE		
Deferred maintenance	DEFMN		
Condition of Assets	COND		
Management Concern	MGTCON		
Accounting Concerns	ACGCON		
Accountability	ACCB		
Asset Management Drive	MGTASSET		
Obsolescence	OBSOL		

RENEWAL ACCOUNTING	(CODE)	TRADITIONAL DEPRECIATION	(CODE)
Why Adopt Renewal Acg.	RNAWHY	Why Adopt Depreciation	WHYDEP
How/Mechanics	RNAHOW	Use of AMPs	AMPDEP
Treatment of Deferred Mn.	DFPROV	What Think About Renewal	TKRNA
Manipulation of Provisions	PROVMAN	Advantage of Depreciation	ADVDEP
Maintenance Expenditure	MNRNA	Disadvantages	DISADEP
Capital Expenditure	CAPRNA	Double Counting	DBLDEP
Calculation of Maintenance	CALCMN	Difficulties in Adopting	DEPDIFF
Advantage of Renewal Acg.	RNADV	Valuation of Assets	DEPVALN
Integrated Management	INTMGT	How/ Mechanics	DEPHOW
Disadvantages of Renewal	RNADIS	Calculation of Rates	DEPRATE
Difficulties in Adopting	RNADIFF	Maintenance Expenditure	MNDEP
Steady State	STEDRNA	Capital Expenditure	DEPCAPEX
Lumpiness	LUMPFND	Funding of Depreciation	DEPFUND
Renewals Holiday	RNAHOL		
Valuation of Assets	RNAVALN		
What Auditors Think	AUDTRNA		
Not GAAP- SSAP Revision	GAAPRNA		
Difficulties to Overcome	DIFFOVER		
Funding	RNAFUND		

APPENDIX 11: ACCOUNTING POLICIES, ASSET INFORMATION SYSTEMS AND AMPs OF SURVEYED LOCAL AUTHORITIES

LOCAL AUTHORITY	Valuation Method	AMP	Asset Information System for Pipeline Assets	Revenue Expenditure	Capital Expenditure
<i>Auckland City Council</i>	ODRC less cumulative unspent maintenance provisions.	Still developing Council's strategic plan is effectively asset management plan in interim.	Commissioned their own software.	Maintenance includes the cost of restoration or replacement or portions of existing asset networks at greater or less capacity than existed previously with or without improvements in technology. Distinguishes between routine maintenance and renewal and replacement expenditure in the operating statement.	Capitalises expenditure which extends the network. Does not regard minor changes in technology as capital.
<i>Manukau City Council</i>	DRC	Have one for roading. Still developing others.	Implementing PAMS	All expenditure which maintains the present capacity and does not increase the capacity of the system is an operational cost.	Where the capacity of the system is increased or added to, then it is a capital improvement. Capitalised backlog of maintenance expenditure on roads which it identified and has eliminated this over a five year period.
<i>North Shore City Council</i>	DRC	Still developing	Implementing PAMS	Routine and Major Maintenance defined in Appendix 4 in this study (classified separately in operating statement).	New additions or increases in service capacity (improvements beyond their original size and capacity) are capitalised.
<i>Waitakere City Council</i>	DRC	Still developing	Implementing PAMS	All expenditure which does not extend or increased the capacity of the system is renewal expenditure.	Expenditure which extends or increases the service capacity of the system is capitalised.
<i>Hamilton City Council</i>	DRC	Still developing	Implementing PAMS	(All expenditure which is not capital expenditure).	Expenditure is considered capital when it creates a new asset or when an existing asset's capacity or service potential is significantly extended.
<i>The Hutt City Council</i>	Method not disclosed.	Still developing	Commissioned their own software.	All expenditure which does not add to the network is replacement or renewal expenditure.	Expenditure which adds to the network is capital expenditure.
<i>Wellington City Council</i>	DRC	Adopted for all assets except still developing water infrastructural asset AMP.	Implementing PAMS	Asset Operations: -Allows an asset to function but does not change its service life : Operations and unplanned maintenance.	Asset Improvement: Extends or expands an asset's service potential: New works which increase the value of an asset; Asset Preservation: Maintains an asset's service life at the current level: planned replacement as per Asset Management Plan.

Continued: LOCAL AUTHORITY	Valuation Method	AMP	Asset Information System for Pipeline Assets	Revenue Expenditure	Capital Expenditure
<i>Christchurch City Council</i>	DRC	Still developing	Implementing PAMS	(All expenditure which is not capital expenditure).	4 categories: Renewals and replacements: maintaining existing assets. Necessary to sustain agreed levels of service; Asset Improvements: capital expenditure that improves or adds to the level of services of existing assets; New Assets: works or purchases creating wholly new assets; Major Enhancement Projects: Refers to major projects in Annual Plan.
<i>Dunedin City Council</i>	DRC	Adopted AMP for Roading. Still developing others.	Implementing PAMS	Defined as expenditure which maintains an asset in working condition and all expenditure incurred in maintaining and operating the Council (1995/96 Annual Plan).	Defined as all expenditure on the creation of a new asset, and any expenditure which results in a significant improvement to the original function of an existing asset and increase in the estimated useful life of the asset (1995/96 Annual Plan).
<i>Watercare Services Ltd</i>	DRC	Have adopted AMPs for water and sewerage assets for the past three years.	Policy not disclosed in annual report or during the interview.	(Expenditure which does not significantly extend the asset's originally anticipated life).	Capital expenditure is anything which significantly extends the originally anticipated life of the asset.
<i>Waimakariri District Council</i>	DRC	Still developing	Implementing PAMS	Maintenance expenditure includes all expenditure which maintains infrastructural assets at their 50% service level.	Expenditure which extends or enhances the capacity or service potential of the system is capitalised.
<i>Banks Peninsula District Council</i>	DRC	Still developing	Implementing PAMS	Maintenance expenditure includes all expenditure on items which restore the infrastructure assets to their original condition.	New systems, extensions or expenditure which enhances the capacity to the system are capitalised.
Summary	10 out of 12 entities use DRC 1 entity uses ODRC Valuation basis not disclosed by 1 entity.	11 out of 12 entities still developing AMPs. 3 entities completed AMPs for some of their infrastructural assets. 1 entity has fully completed AMPs.	9 out of 11 entities subscribed to & implementing PAMS. 2 entities have commissioned their own software. Unsure of policy of 1 entity.	Renewal Accounting: Generally regarded as expenditure which maintains the present capacity of the system and does not extend or increase the overall service capacity or service potential of the network (2 entities distinguish between routine maintenance and renewal and replacement expenditure in the operating statement). Depreciation Accounting: Generally regarded as that which maintains assets but which does not significantly improve or extend an assets estimated useful life or service capacity.	Renewal Accounting: Expenditure which creates new assets and extends the system or significantly enhances the overall service capacity of the system. Depreciation Accounting: Expenditure which creates new assets and which significantly enhances the service capacity or service potential and estimated useful life of individual assets.

APPENDIX 12: RENEWAL AND DEPRECIATION ACCOUNTING POLICIES ADOPTED BY SURVEYED LOCAL AUTHORITIES

(NB: 'N/A' = not applicable to entity because of the accounting policy adopted).

LOCAL AUTHORITY	Renewal	Accounting		Depreciation	Accounting
	Calculation of Maintenance Required on Infrastructural Assets	Provision for Deferred Maintenance	Proportional Allocation	Straight Line Depreciation on Infrastructural Assets	Depreciation Funds Used for Capital Expenditure Programmes
<i>Auckland City Council</i>	Engineer's estimates which are reviewed by external consultants annually.	Yes	No. Increase in capacity of pipes replaced is not allocated proportionally to capital expenditure.	N/A	N/A
<i>Manukau City Council</i>	Engineer's best estimates; Reactive maintenance. No formal programme for sewerage, water and stormwater systems.	Yes	Yes	N/A	N/A
<i>North Shore City Council</i>	Engineer's best estimates of annual average expenditure required on infrastructural assets.	Yes	Yes	Sewerage Treatment Plant is included in fixed assets (presumably depreciated).	N/A
<i>Waitakere City Council</i>	Level of maintenance estimated by engineers and reviewed by external local authority engineers.	Yes	Yes	On bridges.	N/A
<i>Hamilton City Council</i>	N/A	N/A	N/A	On all infrastructural assets.	—
<i>The Hutt City Council</i>	Engineers estimates; Reactive maintenance.	Yes	Yes	N/A	N/A
<i>Wellington City Council</i>	N/A	N/A	N/A	On all infrastructural assets. Expenditure spent on asset preservation basically offsets the amount of depreciation. The amount of depreciation is equivalent to what has been assessed as that which the assets would be devalued by if nothing was spent on the assets.	Funds raised from depreciation (\$35m) are used for the capital expenditure programme.
<i>Christchurch City Council</i>	N/A	N/A	N/A	On all infrastructural assets.	Cash generated from revenue derived to meet depreciation charges is applied to fund renewal works in the first place, followed by capital works and Council debt (approx. \$46m).

Continued:	Renewal Accounting			Depreciation Accounting	
LOCAL AUTHORITY	Calculation of Maintenance	Provision for Deferred maintenance	Proportional Allocation	Straight Line Depreciation on Infrastructural Assets	Depreciation Funds Used for Capital Expenditure Programmes
<i>Dunedin City Council</i>	Annual report indicates that has a maintenance programme for roading surface pavement; also has an AMP for roading.	Yes	?	On roading: bridges, street-lighting, & drainage and water reticulation.	–
<i>Watercare Services Ltd</i>	Calculates a provision for planned maintenance. Based on a long term annual average over 20 years to sustain the system's capabilities at defined levels of service in AMP.	Accrual or Prepayment calculated on difference between actual and annual average.	?	On all infrastructural assets.	–
<i>Waimakariri District Council</i>	Engineers best estimates.	Yes	Yes	Depreciates infrastructural assets down to 50% of their residual value. Bridges over 20 metres and pumps are depreciated on straight line.	N/A
<i>Banks Peninsula District Council</i>	Until AMPs is in place they operate a transitional process of asset management. Policy of 500m/yr of pipe replacement over 40 years. Therefore, based on engineer's best estimates.	Yes	?	N/A	N/A
Summary	<p>6 entities base their maintenance requirements on the basis of engineers' best estimates without the formal backing of fully developed AMPs.</p> <p>2 entities have their estimates reviewed by independent external engineers.</p> <p>Watercare Services Ltd bases annual estimate on its 20 yr forecast in its AMPs to calculate a long term annual average expenditure needed and calculates the difference between this and the actual expenditure in any one year.</p> <p>1 entity has a formal maintenance programme for its roading infrastructural assets; presumably based on AMP.</p>	<p>8 out of 9 entities indicated that a provision for deferred maintenance is made where applicable and deducted from the value of the asset in the balance sheet.</p>	<p>5 out of 9 entities indicated that proportional allocation to capital is used for expenditure which replaces and increases service capacity.</p> <p>1 entity does not regard minor changes in technology as capital and does not allocate proportionally.</p> <p>Unsure of policies of 3 entities.</p>	<p>4 entities use straight line depreciation for all of their infrastructural assets.</p> <p>1 entity uses depreciation for all its infrastructural assets except for roading.</p> <p>3 entities, which use renewal accounting, use depreciation separately for some of their assets, e.g. sewerage treatment plant, bridges, bridges over 20 metres and sewerage pumps.</p> <p>1 entity using renewal accounting depreciates its infrastructural assets down to 50% of their residual value and then expenses maintenance and renewal expenditure on these assets under renewal accounting.</p>	<p>2 entities specifically use the funds generated from depreciation to fund their capital expenditure programmes.</p>

APPENDIX 13: CORRESPONDENCE WITH THE NZSA



New Zealand Society of Accountants

Willbank House, 57 Willis Street, PO Box 11342, Wellington, New Zealand.
Telephone 64-4-473-8544, 473-3068. Fax 64-4-472-6282.

24 August 1995

James Doyle
Department of Accountancy, Finance and Information Systems
University of Canterbury
Private Bag 4800
CHRISTCHURCH

Dear James

Thank you for your letter of 22 August concerning your research in renewals accounting for infrastructure assets.

The exposure draft of the revision of SSAP-3: *Accounting for Depreciation* and SSAP-28: *Accounting for Fixed Assets* has been under development this year. I am not in a position to advise you of whether or not the Financial Reporting Standards Board supports the renewals approach or the depreciation approach, as the Board has not yet debated this issue. I would, however, personally recommend that research in this area should avoid building a false dichotomy between the two approaches.

Both views are being considered by the Financial Reporting Committee preparing the exposure draft, and will in due course be considered by the Financial Reporting Standards Board.

Yours sincerely

A handwritten signature in black ink, appearing to read 'April Mackenzie'.

April Mackenzie
DIRECTOR — Accounting & Professional Standards